

# Oral Program

Sunday 1 December 2019			
14:00-15:50	Registration   Southern Cross lobby		
15:50-16:00	Welcome and Introduction   Sirius Room		
Session Chair	<b>Nidal Hilal</b>		
16:00-16:45	<b>[PLN.01]</b> <b>Whither Desalination?</b> T. Pankratz, <i>Global Water Intelligence, USA</i>		
16:45-17:30	<b>[PLN.02]</b> <b>From marine biology to surface chemistry – The impact on desalination</b> A.V. Ellis, <i>The University of Melbourne, Australia</i>		
17:30-19:30	Welcome drinks reception   Orion/Pleiades Room		
Monday 2 December 2019			
Session Chair	<b>Nidal Hilal</b>		
08:30-09:15	<b>[PLN.03]</b>   Sirius Room Greg Leslie		
09:15-09:25	<b>Special Presentation</b>		
Room	Sirius Room	Admiralty Gulf Room	King Sound
<b>09:25-10:55</b>	<b>Session 1A: Tony Fane Honorary Session A</b>	<b>Session 1B: Reverse Osmosis</b>	<b>Session 1C: Energy and sustainability &amp; Economics</b>
Session Chair	<b>Mikel Duke and Ho Kyong Shon</b>	<b>Amy Childress and Emile R. Cornelissen</b>	<b>Amanda Ellis and Jaeweon Cho</b>
09:25-09:55	<b>[KN.01]</b> <b>Robert Field, University of Oxford, UK</b> Desalination using graphene membranes: Has it been overhyped?	<b>[KN.02]</b> <b>Natural viruses for integrity monitoring of reverse osmosis with a &gt; 7 IRV</b> E. R. Cornelissen* <sup>1,2</sup> , L. M. Hornstra <sup>1</sup> , T. Rodrigues da Silva <sup>3</sup> , B. Blankert <sup>4</sup> , L. Heijnen <sup>1</sup> , E. F. Beerendonk <sup>1</sup> , G. Medema <sup>1,5</sup> , <sup>1</sup> KWR Watercycle Research Institute, The Netherlands, <sup>2</sup> Ghent University, Belgium, <sup>3</sup> Nova University of Lisbon, Portugal, <sup>4</sup> Oasen, The Netherlands, <sup>5</sup> Delft University of Technology, The Netherlands	<b>[KN.03]</b> <b>Perceptions of engineers with desalination</b> J. Cho, <i>Ulsan National Institute of Science and Technology (UNIST), Republic of Korea</i>
09:55-10:10	<b>[O1A.01]</b> <b>Honour talk 1</b>	<b>[O1B.01]</b>	<b>[O1C.01]</b>

	<b>Vicki Chen, University of New South Wales, Australia</b>	<b>Assessing the consequences of RO fouling and ageing for process validation in water recycling</b> P. Le Clech*, A. Antony, G. Leslie, UNSW, Australia	<b>A comparative economic assessment of the hybrid dilution desalination systems and conventional Seawater RO desalination</b> P. Pazouki*, R. Stewart, E. Bertone, F. Helfer, Griffith University, Australia
10:10-10:25	<b>[O1A.02]</b> <b>The effect of intermittent heat supply on graphene oxide composite pervaporation membrane for inland brine treatment</b> W. Cha-umpong* <sup>1</sup> , G. Dong <sup>1</sup> , A. Razmjou <sup>1</sup> , V. Chen <sup>1,2</sup> , <sup>1</sup> University of New South Wales, Australia, <sup>2</sup> University of Queensland, Australia	<b>[O1B.02]</b> <b>Investigating the factors affecting calcium sulfate scaling and its interaction with microorganisms in seawater reverse osmosis</b> M.Y. Ashfaq*, M.A. Al-Ghouti, N. Zouari, H. Qiblawey, Qatar University, Qatar	<b>[O1C.02]</b> <b>Assessment of water quality variations on environmental impacts of SWRO desalination</b> A.H. Al-Kaabi*, H.R. Mackey, Hamad Bin Khalifa University, Qatar
10:25-10:40	<b>[O1A.03]</b> <b>Honour talk 2</b> <b>P. Le Clech, UNSW, Australia</b>		
10:40-10:55	<b>[O1A.04]</b> <b>Honour talk 3</b> <b>G. Leslie, UNSW, Australia</b>		
10:55-11:25	Refreshments   Room: Orion/Pleiades Room		
<b>11:25-12:25</b>	<b>Session 2A: Tony Fane Honorary Session B</b>	<b>Session 2B: Membrane systems and configurations</b>	<b>Session 2C: Membrane fouling and control</b>
Session Chair	<b>Robert Field and Bruce Biltof</b>	<b>Raed Hashaikeh and Zulhaj Rizki</b>	<b>Jaeweon Cho and Noredine Ghaffour</b>
11:25-11:40	<b>[O2A.01]</b> <b>Honour talk 4</b> <b>Prof. Tony Fane's contribution to Singapore in membrane research</b> R. Wang, Nanyang Technological University, Singapore	<b>[O2B.01]</b> <b>Designing a membrane cascade: A multi-criteria approach to select process conditions</b> Z. Rizki*, A.E.M. Janssen, G.D.H. Claassen, R.M. Boom, A. van der Padt, Wageningen University, The Netherlands	<b>[O2C.01]</b> <b>Novel feed spacers design for fouling mitigating in membrane filtration</b> S. Kerdi, A. Qamar, J. Vrouwenvelder, N. Ghaffour*, KAUST, Saudi Arabia
11:40-11:55		<b>[O2B.02]</b> <b>Designing an energy self-sufficient desalination plant utilizing the seawater battery desalination system</b> M. Ligaray*, N. Kim, S. Park, K. Kishor, J. Park, J. Park, Y. Kim, K. Cho, Ulsan National Institute of Science and Technology, Republic of Korea	<b>[O2C.02]</b> <b>Evaluating the influence of novel feed spacers on backwash and relaxation for enhancement of cleaning strategies</b> N. Sreedhar* <sup>1</sup> , N. Thomas <sup>1</sup> , O. Al-Ketan <sup>1</sup> , R. Rowshan <sup>2</sup> , R. Al-Rub <sup>1</sup> , H. Arafat <sup>1</sup> , <sup>1</sup> Khalifa University of Science and Technology, United Arab Emirates, <sup>2</sup> New York University, Abu Dhabi, United Arab Emirates
11:55-12:10	<b>[O2A.03]</b>	<b>[O2B.03]</b>	

	<b>Thermodynamic analysis of membrane-based osmotic battery for intermittent renewable energy storage</b> Q. She* <sup>1</sup> , Y.H. Lau <sup>3</sup> , A.G. Fane <sup>1,2</sup> , <sup>1</sup> Nanyang Technological University, Singapore, <sup>2</sup> University of New South Wales, Australia, <sup>3</sup> The University of Sydney, Australia	<b>Novel ion exchange resins and regeneration process for desalination</b> T. Gettongsong*, R. Pashley, UNSW Canberra, Australia	
12:10-12:25	<b>[O2A.04]</b> <b>Honour talk 6</b> <b>N. Hankins, The University of Oxford, UK</b>		
12:25-13:25	<b>DuPont Water Solutions Satellite Symposia at MEMDES   Sirius Room</b> Santhosh Ramalingan, PhD, Technical Manager, DuPont Water Solutions		
12:25-13:00	Lunch   Room: Orion/Pleiades Room		
13:00-14:00	Poster session 1   Room: Orion/Pleiades Room		
<b>14:00-15:30</b>	<b>Session 3A: Pre-treatment and post-treatment processes</b>	<b>Session 3B: Membrane distillation</b>	<b>Session 3C: Membrane fouling and control</b>
Session Chair	<b>Tom Pankratz and Graeme K. Pearce</b>	<b>Huanting Wang and Vicki Chen</b>	<b>Greg Leslie and Yung Chang</b>
14:00-14:30	<b>[KN.04]</b> <b>Comparative survey of membrane and conventional pre-treatment for the control of bio-fouling in seawater desalination</b> G.K. Pearce, Membrane Consultancy Associates, UK	<b>[KN.05]</b> <b>Vicki Chen, University of New South Wales, Australia</b> Membrane Distillation and Pevaporation for Desalination and Resource Recovery	<b>[KN.06]</b> <b>Antifouling membrane system for sustentable water treatment</b> Y. Chang, Chung Yuan Christian University, Taiwan
14:30-14:45	<b>[O3A.01]</b> <b>Application of pulsating flow, pH adjustment and waste heat to enhance zeolite performance for pre-treating drilling wastewater prior to a desalination stage</b> J. Gholami-Shiri <sup>1</sup> , C. Salari <sup>1</sup> , S. Dehghani <sup>1</sup> , G.J. Millar* <sup>1</sup> , <sup>1</sup> Shiraz University, Iran, <sup>2</sup> Islamic Azad University, Iran, <sup>3</sup> University of Sistan and Baluchestan, Iran, <sup>4</sup> Queensland University of Technology, Australia	<b>[O3B.01]</b> <b>Multi-stage vacuum membrane distillation (MS-VMD) for the recovery of volatile draw solutes using low-grade waste heat</b> C.D. Peters*, N.P. Hankins, University of Oxford, UK	<b>[O3C.01]</b> <b>PES UF membrane biofouling mitigation viablending</b> Y. Orooji*, M. Mansoorianfar, A. Razmjou, Nanjing Forestry University, China
14:45-15:00	<b>[O3A.02]</b> <b>Comparison of bank filtration and powder active carbon pretreatment on nanofiltration membrane fouling control and mechanisms</b>	<b>[O3B.02]</b> <b>A co-axial electrospinning to fabricate superhydrophobic membrane for seawater membrane distillation</b> Y.C. Woo* <sup>1</sup> , J-S. Choi <sup>1</sup> , K-D. Park <sup>1</sup> , H.K. Shon <sup>2</sup> , <sup>1</sup> Korea Institute of Civil Engineering and Building Technology (KICT), Republic of	<b>[O3C.02]</b> <b>Anti-adhesion and biofouling studies of zwitterionic coatings of feed spacer in RO-modules</b> M. Jablonska*, M. Rühl, M. Menzel, U. Hirsch, A. Heilmann, Fraunhofer Institute for

	Z. Gan, F. Meng, T. Wang, J. Wang, H. Liang*, G. Li, Harbin Institute of Technology, China	Korea, <sup>2</sup> University of Technology Sydney, Australia	Microstructure of Materials and Systems IMWS, Germany
15:00-15:15	<b>[O3A.03]</b> <b>Hybrid coagulation /sand filter as pre-treatment to the removal of oil from oil-water emulsion</b> A. Almojjily*, N. Hilal, Swansea University, UK	<b>[O3B.03]</b> <b>Important aspects of membrane distillation to boost recovery from high salinity water</b> A. Achilli*, M. Hardikar, I. Marquez, T. Phakdon, University of Arizona, USA	<b>[O3C.03]</b> <b>A facile strategy to enhance ultrafiltration membrane performance in gravity-driven system via deposition of micro fine particles</b> D. Song <sup>1</sup> , W. Zhang <sup>3</sup> , C. Liu* <sup>2</sup> , J. Ma <sup>1</sup> , <sup>1</sup> Harbin Institute of Technology, China, <sup>2</sup> Chongqing University, China, <sup>3</sup> Tianjin Chengjian University, China
15:15-15:30	<b>[O3A.04]</b> <b>A Sustainable remineralisation process for reverse osmosis permeate</b> A.A.M. Abusultan* <sup>1</sup> , J.A. Wood <sup>1</sup> , T. Sainio <sup>2</sup> , A.J.B. Kemperman <sup>1</sup> , W.G.J. van der Meer <sup>1,3</sup> , <sup>1</sup> University of Twente, The Netherlands, <sup>2</sup> LUT University, Finland, <sup>3</sup> Oasen Drinkwater, The Netherlands	<b>[O3B.04]</b> <b>Direct Contact Membrane distillation of real produced water</b> H. Al Abdulgader*, D. Marques, R. Vilagines, Saudi Aramco, Saudi Arabia	<b>[O3C.04]</b> <b>Allelopathic effects of extracellular organic matter by mixed algal co-cultures on UF membrane fouling behavior</b> K. Gao* <sup>1</sup> , T. Li <sup>1</sup> , J. Liu <sup>2</sup> , B. Dong <sup>1</sup> , Q. Zhao <sup>1</sup> , <sup>1</sup> Tongji University, China, <sup>2</sup> Guangdong University of Technology, China
<b>15:30-16:00</b>	Refreshments   Room: Orion/Pleiades Room		
<b>16:00-17:00</b>	<b>Session 4A: Author Workshop</b>	<b>Session 4B: Forward osmosis and Other Technologies</b>	<b>Session 4C: Nanofiltration, ultrafiltration, microfiltration</b>
Session Chair	<b>Deirdre Dunne, Elsevier Ltd., The Netherlands</b>	<b>Tao He and Robert Field</b>	<b>Ho Kyong Shon and Takeshi Matsuura</b>
16:00-16:15	<b>Deirdre Dunne, Executive Publisher, Chemical &amp; Environmental Engineering, Elsevier, Amsterdam, The Netherlands</b> This talk aims to give participants a clear idea of the publishing landscape and provides detailed insights into identifying the right journal before starting to write a paper	<b>[O4B.01]</b> <b>"Breakthrough" osmosis: Is there an overlooked mode that would yield very high power densities?</b> J.J. Wu* <sup>2</sup> , R.W. Field <sup>1</sup> , <sup>1</sup> University of Oxford, UK, <sup>2</sup> Durham University, UK	<b>[O4C.01]</b> <b>Fabrication of thin-film composite membranes with unique 3D surface nano-structures mediated by Noria-polyethyleneimine co-deposition</b> Q.J. Niu*, Z. Zhai, C. Jiang, N. Zhao, China University of Petroleum(East China), China
16:15-16:30		<b>[O4B.02]</b> <b>Numerical optimization of full scale forward osmosis system using hollow fibre membrane</b> S.M. Ali, S. Phuntsho*, H.K. Shon, University of Technology Sydney, Australia	<b>[O4C.02]</b> <b>Design of membranes with asymmetric wettability for performance improvement of UF membrane</b> L. Zoka, R. Narbaitz, T. Matsuura*, University of Ottawa, Canada
16:30-16:45		<b>[O4B.03]</b> <b>Using green solvents for boron removal in SWRO pretreatment</b>	<b>[O4C.03]</b> <b>Separation of chiral drugs by nanofibrous composite membranes with chiral selector</b>

		G. Almustafa*, R. Sulaiman, I. AlNashef, H. Arafat, <i>Khalifa University, United Arab Emirates</i>	J. Gaalova <sup>1</sup> , F. Yalcinkaya <sup>2</sup> , P. Curinova <sup>1</sup> , M. Kohout <sup>3</sup> , B. Yalcinkaya <sup>2</sup> , M. Kostejn <sup>1</sup> , I. Stibor <sup>2</sup> , P. Izak* <sup>1</sup> , <sup>1</sup> <i>Czech Academy of Sciences, Czech Republic</i> , <sup>2</sup> <i>Technical University of Liberec, Czech Republic</i> , <sup>3</sup> <i>University of Technology in Prague, Czech Republic</i>
16:45-17:00		<b>[O4B.04]</b> <b>Review of membrane technologies for water treatment in Eastern European power generation</b> J. Marek* <sup>1</sup> , J. Sláma <sup>2</sup> , M.S. Santos <sup>3</sup> , <sup>1</sup> <i>Technical University of Liberec, Czech Republic</i> , <sup>2</sup> <i>Univiversité Grenoble Alpes, France</i> , <sup>3</sup> <i>Texas A&amp;M University at Qatar, Qatar</i>	
<b>17:00-18:00</b>	<b>Meet the Editor's session</b>   Sirius Room <b>Session Chair: Nidal Hilal, Swansea University, UK</b> A special event at the MEMDES 2019 is a "Meet the Editors Session" where Editor in Chief of Desalination (Professor Nidal Hilal), Editor of Journal of Membrane Science (Professor Rong Wang) and co-Editor in Chief of Journal of Water Process Engineering ( Professor Nicholas Hankins) will introduce their journals and scopes, discuss factors to consider when choosing a journal, and then give their advice on how to write papers for successful publication		
<b>Tuesday 3 December 2019</b>			
08:30-09:15	<b>[PLN.04]</b>   Sirius Room <b>Metal-organic framework-based membranes for ion separations</b> H. Wang, <i>Monash University, Australia</i>		
Session Chair	<b>Mikel Duke</b>		
Room	Sirius Room	Admiralty Gulf Room	King Sound
<b>09:15-10:45</b>	<b>Session 5A: Membrane systems and configurations</b>	<b>Session 5B: Materials</b>	<b>Session 5C: Brine</b>
Session Chair	<b>Amy Childress and Marian Turek</b>	<b>Xiao-Lin Wang and Vicki Chen</b>	<b>Seungkwan Hong and Nick Hankins</b>
09:15-09:30	<b>[KN.07]</b> <b>One water not two: Synergistic blending opportunities for water reuse and desalination</b> A. Childress, <i>University of Southern California, USA</i>	<b>[O5B.01]</b> <b>Influence of graphene oxide lateral size on the properties of thin-film composite membranes</b> N. Akther <sup>1</sup> , Y. Chen <sup>2</sup> , S. Phuntsho* <sup>1</sup> , N. Ghaffour <sup>3</sup> , H.K. Shon <sup>1</sup> , <sup>1</sup> <i>University of Technology Sydney, Australia</i> , <sup>2</sup> <i>University of Sydney, Australia</i> , <sup>3</sup> <i>King Abdullah University of Science and Technology, Saudi Arabia</i>	<b>[KN.08]</b> <b>Osmotically-assisted Reverse Osmosis (OARO): Some new approaches to dewatering high salinity brines to high recovery using membrane processes</b> N. Hankins, <i>The University of Oxford, UK</i>

09:30-09:45		<b>[O5B.02]</b> <b>Novel nanocomposite membranes for osmotically driven processes: Fabrication and Application</b> S. Lim, S. Phuntsho, H. Shon*, <i>University of Technology Sydney, Australia</i>	
09:45-10:00	<b>[O5A.01]</b> <b>Brine treatment in a hybrid NF-RO-ED system</b> M. Turek*, K. Mitko, E. Laskowska, <i>Silesian University of Technology, Poland</i>	<b>[O5B.03]</b> <b>Graphene oxide thin film as pervaporation desalination membrane – a study of the mass transfer mechanism</b> J. Hou*, V. Chen, <i>University of Queensland, Australia</i>	<b>[O5C.01]</b> <b>Preparation of lithium hydroxide from salt lake brine by bipolar membrane electro dialysis</b> Y.J. Zhao* <sup>1,2</sup> , H.Y. Wang <sup>1</sup> , Y. Li <sup>1,3</sup> , M. Wang <sup>1</sup> , <sup>1</sup> Chinese Academy of Sciences, China, <sup>2</sup> Beijing University of Chemical Technology, China, <sup>3</sup> University of Chinese Academy of Sciences, China
10:00-10:15	<b>[O5A.02]</b> <b>Feasibility of two-stage seawater reverse osmosis for treating extremely high-saline seawater with high temperature</b> J. Kim*, K. Park, S. Hong, <i>Korea University, Republic of Korea</i>	<b>[O5B.04]</b> <b>Synthesis, characterization and application of kaolin-based zsm-5 zeolite for the removal of salt ions from saline solution</b> U.M. Aliyu, S. Rathilal, Y.M. Isa*, <i>Durban University of Technology, South Africa</i>	<b>[O5C.02]</b> <b>Transforming salty dairy wastewater into cleaning chemicals using Electrodialysis with Bipolar Membranes (EDBM)</b> X. Chen, G.Q. Chen*, S.E. Kentish, <i>The University of Melbourne, Australia</i>
10:15-10:30	<b>[O5A.03]</b> <b>Work integration through pressure exchanger networking in PRO-desalination hybrid systems</b> H. Manzoor* <sup>1</sup> , S. Matta <sup>1</sup> , M.A. Selam <sup>1</sup> , S. Adham <sup>2</sup> , M. Castier <sup>1</sup> , A. Abdel-Wahab <sup>1</sup> , <sup>1</sup> Texas A&M University, Qatar, <sup>2</sup> Global Water Sustainability Center, Qatar		<b>[O5C.03]</b> <b>Comparison of conventional electro dialysis (ED) and monovalent selective electro dialysis (SED) in treating reverse osmosis (RO) brine</b> Y. Yang*, Y-Z. Sun, J-G. Yu, <i>East China University of Science and Technology, China</i>
10:30-10:45	<b>[O5A.04]</b> <b>Inhibition of micro-plastic particles on advanced oxidation process of trace organic compounds used for feed solution of forward osmosis process</b> H.H. Lee*, S.J. Im, A. Jang, <i>Sungkyunkwan University, Republic of Korea</i>		
<b>10:45-11:15</b>	Refreshments   Room: Orion/Pleiades Room		
<b>11:15-12:15</b>	<b>Session 6A: Materials</b>	<b>Session 6B: Electrochemical systems</b>	<b>Session 6C: Industrial wastewater</b>
Session Chair	<b>Raed Hashaikeh and Masoumeh Zargar</b>	<b>Bruce Biltof and Tianyu Wang</b>	<b>Yung Chang and Thollwana Makhetha</b>
11:15-11:30	<b>[O6A.01]</b>	<b>[O6B.01]</b>	<b>[O6C.01]</b>

	<p><b>Advanced thin film nanocomposite membranes embedded with hollow mesoporous silica nanoparticles</b> M. Zargar*<sup>1,2</sup>, M. Johns<sup>2</sup>, Y. Hartanto<sup>1</sup>, B. Jin<sup>1</sup>, S. Dai<sup>1,3</sup>, <sup>1</sup>The University of Adelaide, Australia, <sup>2</sup>University of Western Australia, Australia, <sup>3</sup>Brunel University London, UK</p>	<p><b>Effect of iron scaling on performance and characteristic of membrane capacitive deionization (MCDI)</b> T. Wang*, L. Bai, Z. Gan, G. Li, H. Liang, Harbin Institute of Technology, China</p>	<p><b>Ultrafiltration membrane composites tailored by ZIF@GO with highly improved organic dye rejection performances</b> T.A. Makhetha*<sup>1,2</sup>, R.M. Moutloali<sup>1,2</sup>, <sup>1</sup>University of Johannesburg, South Africa, <sup>2</sup>DST/Mintek Nanotechnology Innovation Centre, South Africa</p>
11:30-11:45	<p><b>[O6A.02] Surface modified nano-enhanced TFC membranes make a difference</b> M. Zargar*<sup>1,2</sup>, M. Johns<sup>2</sup>, Y. Hartanto<sup>1</sup>, B. Jin<sup>1</sup>, S. Dai<sup>1,3</sup>, <sup>1</sup>The University of Adelaide, Australia, <sup>2</sup>University of Western Australia, Australia, <sup>3</sup>Brunel University London, UK</p>	<p><b>[O6B.02] Control of diluate purity in scalable multichamber shock electro dialysis unit</b> J. Cizek*, J. Marek, Technical University of Liberec, Czech Republic</p>	<p><b>[O6C.02] Removal of anionic and cationic dyes from wastewater using composite of natural polymer/metal-organic framework (MOFs) membranes</b> G. Gnanasekaran*<sup>1</sup>, D. Kulmatova<sup>1</sup>, S. M.S.P.<sup>1</sup>, Y.S. Mok<sup>1</sup>, A. Gangasalam<sup>2</sup>, <sup>1</sup>Jeju National University, Republic of Korea, <sup>2</sup>National Institute of Technology, India</p>
11:45-12:00	<p><b>[O6A.03] Preparation and application of mesoporous carbon nanostructure-metal oxide composites for capacitive deionization</b> S.H. Lee*<sup>1,2</sup>, S.M. Lee<sup>1,3</sup>, J.W. Park<sup>1,2</sup>, D.H. Jung<sup>1,3</sup>, <sup>1</sup>Korea Institute of Energy Research (KIER), Republic of Korea, <sup>2</sup>Yonsei University, Republic of Korea, <sup>3</sup>University of Science and Technology (UST), Republic of Korea</p>	<p><b>[O6B.03] A novel application of bipolar membrane electro dialysis system with a crystallizer on carbon dioxide adsorption and mineralization via seawater decalcification</b> Y. Zhao*, J. Wang, J. Yuan, Hebei University of Technology, China Institute, China   <i>Scaling mitigation in membrane distillation: From superhydrophobic to slippery</i></p>	<p><b>[O6C.03] Removal of EE2 from water using customized PDMS composite membrane</b> W. Kujawski<sup>1</sup>, A. Atisha<sup>2</sup>, J. Kujawa*<sup>1</sup>, M. Bernards<sup>2</sup>, E. Yanful<sup>2</sup>, <sup>1</sup>Nicolaus Copernicus University in Torun, Poland, <sup>2</sup>Western University, Canada</p>
12:00-12:15		<p><b>[O6B.04] Flow-electrode capacitive deionization for energy-efficient brackish water desalination</b> J.X. Ma*<sup>1</sup>, C. He<sup>1</sup>, J.J. Ma<sup>2</sup>, C.Y. Zhang<sup>1</sup>, D. Waite<sup>1</sup>, <sup>1</sup>UNSW Sydney, Australia, <sup>2</sup>Tsinghua University, China</p>	<p><b>[O6C.04] Treatment of saline domestic wastewater using nanofiltration membrane coupled with activated carbon</b> T. Istirokhatun, R. Mulyanti, I.N. Widiyasa, H. Susanto*, Diponegoro University, Indonesia</p>
<b>12:15-13:00</b>	<b>Lunch   Room: Orion/Pleiades Room</b>		
13:00-14:00	Poster session 2   Room: Orion/Pleiades Room		
<b>14:00-15:30</b>	<b>Session 7A: Nanofiltration, ultrafiltration, microfiltration</b>	<b>Session 7B: Forward osmosis</b>	<b>Session 7C: Membrane fouling and control</b>
Session Chair	<b>Vicki Chen and Bruce Biltof</b>	<b>Rong Wang and Hideto Matsuyama</b>	<b>Emile Cornelissen and Tao He</b>
14:00-14:30	<p><b>[KN.09] Bruce Biltof, Evoqua Water Technologies Membrane Systems Pty Ltd</b></p>	<p><b>[KN.10] Development of star-shaped oligomers with a glycerol backbone as draw solutes for forward osmosis</b></p>	<p><b>[KN.11] Scaling mitigation in membrane distillation: From superhydrophobic to slippery</b> T. He, Chinese Academy of Sciences, China</p>

	Low Pressure Membrane Pre-Treatment Evolution – driving down the cost of Desalination	H. Matsuyama*, A. Inada, K. Kumagai, Kobe University, Japan	
14:30-14:45	<b>[O7A.01]</b> <b>Fouling-resistant nanofiltration process using internally staged design for improving energy efficiency</b> H. Kim, J. Kim, J-H. Lee, S.K. Hong*, Korea University, Republic of Korea	<b>[O7B.01]</b> <b>Brackish water desalination for agriculture: Assessing the performance of inorganic fertilizer draw solutions</b> W. Suwaileh* <sup>1</sup> , D. Johnson <sup>1</sup> , N. Hilal <sup>1,2</sup> , <sup>1</sup> Swansea University, UK, <sup>2</sup> New York University Abu Dhabi, United Arab Emirates	<b>[O7C.01]</b> <b>Application of electrospinning to surface modification of fo membrane to increase antifouling property by enhancing repulsive force</b> S.H. Oh*, S. Jeong, A. Jang, Sungkyunkwan University, Republic of Korea
14:45-15:00	<b>[O7A.02]</b> <b>Crownether containing poly-electrolyte multilayer membranes for Lithium recovery</b> M. Kazemabad <sup>1</sup> , A. Verliefde <sup>1</sup> , E.R. Cornelissen* <sup>1,2</sup> , A. D'Haese <sup>1</sup> , <sup>1</sup> Ghent University, Belgium, <sup>2</sup> KWR Water Cycle Research Institute, The Netherlands	<b>[O7B.02]</b> <b>Forward osmosis application in industrial water management of dairy, automobile and semiconductor industries</b> A. Haupt, A. Lerch*, Technische Universität Dresden, Germany	<b>[O7C.02]</b> <b>Performance analysis of community RO plants with special emphasis on membrane fouling</b> A. Soti, A.B. Gupta*, Malviya National Institute of Technology, India
15:00-15:15	<b>[O7A.03]</b> <b>Integrated membrane technologies for water purification and wastewater recycling in China</b> X-L. Wang <sup>1</sup> , <sup>1</sup> Tsinghua University, China, <sup>2</sup> Kogakuin University, Japan	<b>[O7B.03]</b> <b>Cross-linked layer by layer forward osmosis membrane for brackish water desalination</b> W. Suwaileh*, D. Johnson, S. Khodabakhshi, N. Hilal, Swansea University, UK	<b>[O7C.03]</b> <b>Influence of oil droplet size distribution on fouling mechanisms of UF/MF membranes during filtration of oil nano-emulsions</b> H. Idrees*, I. ElSherbiny, S. Panglisch, University of Duisburg-Essen, Germany
<b>15:15-16:00</b>	Refreshments   Room: Orion/Pleiades Room		
<b>16:00-17:00</b>	<b>Session 8A: Membrane systems and Module design</b>	<b>Session 8B: Membrane distillation</b>	<b>Session 8C: Nanofiltration</b>
Session Chair	<b>Hideito Matsuyama and Shu Ting Ooi</b>	<b>Luke Zappia and Noredine Ghaffour</b>	<b>Graeme Pearce and Emile Cornelissen</b>
16:00-16:15	<b>[O8A.01]</b> <b>Novel pressure-driven membrane fabrication and spiral wound module configuration for low energy filtration applications</b> S.T. Ooi*, L.M. Goh, C. Gudipati, Separation Technologies Applied Research and Translation (START) Centre, Singapore	<b>[O8B.01]</b> <b>On improving the solar assisted evaporation of saltwater by PVDF membranes</b> M. Bahman <sup>1</sup> , I. Mustafa <sup>1</sup> , M. Mavukkandy* <sup>1</sup> , F. AlMarzooqi <sup>1</sup> , <sup>1</sup> Khalifa University of Science and Technology, United Arab Emirates, <sup>2</sup> Massachusetts Institute of Technology, USA	<b>[O8C.01]</b> <b>Diffusion of ions and solutes in nanofiltration systems</b> A. Al-Saadi*, H. Abdullatif, G. Vakili, A. Gujrath, Sultan Qaboos University, Oman
16:15-16:30	<b>[O8A.02]</b> <b>CFD modelling of flat sheet air gap membrane desalination modules</b> K. Cramer, S. Leyer*, University of Luxembourg, Luxembourg	<b>[O8B.02]</b> <b>Novel VMD configuration for water vapor flux enhancement</b> A. Alsaadi, A. Alpatova, J.G. Lee, L. Francis, N. Ghaffour*, KAUST, Saudi Arabia	<b>[O8C.02]</b> <b>Effect of Varying the casting bath temperature on preparation, morphology, and performance of polyacrylonitrile igepal blend asymmetric membranes</b>



			E. Yusuf*, K. Huddersman, J. Muff, De Montfort University Leicester, UK
16:30-16:45	<b>[O8A.03]</b> <b>Statistical analysis and optimization of a novel helical air gap membrane distillation system</b> V.T. Shahu*, S.B. Thombre, VNIT, India	<b>[O8B.03]</b> <b>Performance comparison of direct contact membrane distillation (DCMD) and vacuum membrane distillation (VMD) integrated with heat exchangers</b> N. Dutta*, S. Subbiah, Indian Institute of Technology, Guwahati, India	<b>[O8C.03]</b> <b>Organic transport in ion-exchange membrane: Influence of salt presence and organics properties</b> L. Ma, L. Gutierrez, M. Vanoppen, M. Waqas, A. Verliefde, E. Cornelissen*, Ghent University, Belgium
16:45-17:00	<b>[O8A.04]</b> <b>Understanding the thermodynamics of membrane synthesis and its role in greywater treatment</b> A. Mukherjee <sup>1</sup> , S. Lanjewar <sup>1</sup> , P. Khandewal* <sup>1</sup> , A. Ghosh <sup>2</sup> , S. Moulik <sup>3</sup> , A. Roy <sup>1</sup> , <sup>1</sup> BITS Pilani K.K.Birla Goa Campus, India, <sup>2</sup> Bhabha Atomic Research Centre, India, <sup>3</sup> Indian Institute of Chemical Technology, India	<b>[O8B.04]</b> <b>High salinity water (RO reject water and natural groundwater) treated using large scale AGMD</b> O. Naji, L. Bowtell, R. Al-juboori, A. Alpatova, N. Ghaffour*, University of Southern Queensland, Australia	<b>[O8C.04]</b> <b>Feasibility evaluation of flow-capacitive deionization for treating seawater reverse osmosis permeate in seawater desalination</b> J.B. Kim*, H.J. Chung, S.K. Hong, Korea University, Republic of Korea
<b>18:30-22:00</b>	<b>Conference Dinner</b> Little Creatures Brewing Company		
<b>Wednesday 4 December 2019</b>			
08:30-09:15	<b>[PLN.05]</b>   Sirius Room <b>Integrated membrane technologies for water purification and wastewater recycling in China</b> X-L. Wang, Tsinghua University, China		
Session Chair	<b>Tony Fane</b>		
Room	Sirius Room	Admiralty Gulf Room	King Sound
<b>09:15-10:45</b>	<b>Session 9A: Membrane systems and Materials</b>	<b>Session 9B: Membrane distillation</b>	<b>Session 9C: Case Studies</b>
Session Chair	<b>Tao He and Raed Hashaikeh</b>	<b>Seungkwan Hong and Rong Wang</b>	<b>Nick Hankins and Luke Zappia</b>
09:15-09:45	<b>[KN.12]</b> <b>Cellulose and nano-zeolites to enhance membranes performance</b> R. Hashaikeh, Khalifa University of Science and Technology, United Arab Emirates	<b>[KN.13]</b> <b>Performance enhancement of membrane distillation process via membrane surface modification for surfactant-containing feed water</b> R. Wang, Nanyang Technological University, Singapore	<b>[KN.14]</b> <b>Luke Zappia, Water Corporation of Western Australia, Australia</b> Perspectives and contributions on membrane treatment and operations; drought proofing our six seasons state
09:45-10:00	<b>[O9A.01]</b>	<b>[O9B.01]</b>	<b>[O9C.01]</b>

	<p><b>Selective potassium separation by a combination of a liquid supported membrane and electro dialysis</b>  Z. Qian*<sup>1,3</sup>, H. Miedema<sup>3</sup>, L.C.P.M.J. de Smet<sup>2</sup>, S. Sahin<sup>2</sup>, E.J.R. Sudhölter<sup>1</sup>, <sup>1</sup><i>Delft University of Technology, The Netherlands</i>, <sup>2</sup><i>Wageningen University &amp; Research, The Netherlands</i>, <sup>3</sup><i>Wetsus, The Netherlands</i></p>	<p><b>One-step superhydrophobic electrospun membrane for Air Gap Membrane Distillation (AGMD)</b>  H. Attia*<sup>1,2</sup>, N. Hilal<sup>1</sup>, <sup>1</sup><i>Swansea University, UK</i>, <sup>2</sup><i>Al Mustansiriyah University, Iraq</i></p>	<p><b>Community-sized decentralized reverse osmosis plant and associated environmental concerns in its life-cycle: A case study of Rajasthan</b>  L. Saini, A.B. Gupta*, S. Shrivastava, <i>Malaviya National Institute of Technology, India</i></p>
10:00-10:15	<p><b>[O9A.02]  An experimental and modelling/simulation of poly (piperizinamide) thin film composite membrane for the separation of monovalent and bivalent salts from water using artificial neural network (ANN)</b>  R. Mahadeva*<sup>1</sup>, R. Mehta<sup>2</sup>, G. Manik<sup>1</sup>, A. Bhattacharya<sup>2</sup>, <sup>1</sup><i>Indian Institute of Technology, India</i>, <sup>2</sup><i>CSIR-Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI), Council of Scientific &amp; Industrial Research (CSIR), India</i></p>	<p><b>[O9B.02]  Chemical integration of hydrophilic chitosan in PVDF membrane as an enhancer for the membrane distillation process</b>  S. Al-Gharabli*<sup>1</sup>, J. Kujawa<sup>2</sup>, B. Al-Omari<sup>1</sup>, W. Kujawski<sup>2</sup>, <sup>1</sup><i>German Jordanian University, Jordan</i>, <sup>2</sup><i>Nicolaus Copernicus University in Torun, Poland</i></p>	<p><b>[O9C.02]  Case studies: Payback period of switching from ion exchange to membrane water treatment in European power generation</b>  J. Slama*<sup>1</sup>, J. Marek<sup>2</sup>, M.S. Santos<sup>3</sup>, <sup>1</sup><i>University Grenoble Alpes, Grenoble, France</i>, <sup>2</sup><i>Technical University of Liberec, Liberec, Czech Republic</i>, <sup>3</sup><i>Texas A&amp;M University of Qatar, Qatar</i></p>
10:15-10:30	<p><b>[O9A.03]  Progress in electrospinning in desalination and treatment of wastewater</b>  M. Abdelkareem<sup>1,2</sup>, M. Obaid<sup>2,3</sup>, E. Sayed<sup>2</sup>, H. Mohamed<sup>2</sup>, N. Ghaffour*<sup>3</sup>, <sup>1</sup><i>University of Sharjah, United Arab Emirates</i>, <sup>2</sup><i>Minia University, Egypt</i>, <sup>3</sup><i>King Abdullah University of Science and Technology, Saudi Arabia</i></p>	<p><b>[O9B.03]  Incorporation of nanosized LTL zeolites in dual-layered PVDF-HFP/cellulose membrane for enhanced membrane distillation performance</b>  H. Nassrullah*, O. Makanjuola, I. Janajreh, F.A. AlMarzooqi, R. Hashaikheh, <i>Khalifa University, United Arab Emirates</i></p>	
10:30-10:45	<p><b>[O9A.04]  Novel electrospun nanofiber membrane for seawater desalination</b>  A.A. Shah*<sup>1,2</sup>, S.E. Nam<sup>1</sup>, Y.I. Park<sup>1,2</sup>, Y.H. Cho<sup>1</sup>, H.S. Park<sup>1,2</sup>, <sup>1</sup><i>Korea Research Institute of Chemical Technology (KRICT), Republic of Korea</i>, <sup>2</sup><i>University of Science and Technology (UST), Republic of Korea</i></p>	<p><b>[O9B.04]  Humic acid diffusion through membranes during desalination by membrane distillation</b>  D. Amaya-Vías<sup>2,1</sup>, J.A. López-Ramírez<sup>2</sup>, S. Gray<sup>1</sup>, J. Zhang<sup>1</sup>, M. Duke*<sup>1</sup>, <sup>1</sup><i>Victoria University, Australia</i>, <sup>2</sup><i>University of Cadiz, Spain</i></p>	
<b>10:45-11:15</b>	Refreshments   Room: Orion/Pleiades Room		
<b>11:15-12:00</b>	<b>Session 10A: Resource recovery</b>	<b>Session 10B: Fouling</b>	<b>Session 10C: Optimization and energy production</b>
Session Chair	<b>Amy Childress and Nidal Hilal</b>	<b>Graeme Pearce and Mikel Duke</b>	<b>Jaeweon Cho and Raquel Ibáñez</b>

11:15-11:30	<b>[O10A.01]</b> <b>Ion-selective membranes with subnanometer channels for the extraction of Lithium ions from seawater and brine</b> A. Razmjou* <sup>1</sup> , V. Chen <sup>2</sup> , <sup>1</sup> University of New South Wales, Australia, <sup>2</sup> University of Queensland, Australia	<b>[O10B.01]</b> <b>Role of chemical cleaning agents in transport of trace organic compounds through fouled nanofiltration membranes</b> Z. Gan*, H. Liang, X. Zhu, J. Wang, T. Wang, G. Li, Harbin Institute of Technology, China	<b>[O10C.01]</b> <b>Using the monetized footprint index for the environmental assessment of a solar-powered chemicals self-supplied desalination plant</b> M. Herreo-Gonzalez <sup>1</sup> , A. Wolfson <sup>2</sup> , A. Dominguez-Ramos <sup>1</sup> , R. Ibáñez* <sup>1</sup> , A. Irabien <sup>1</sup> , <sup>1</sup> Universidad de Cantabria, Spain, <sup>2</sup> Sami Shamoon College of Engineering, Israel
11:30-11:45	<b>[O10A.02]</b> <b>Selective separation of lithium from high Mg/Li ratio old brine using selective electrodialysis: Performance and mechanism</b> J.D. Ying*, M.J. Luo, J.G. Yu, East China University of Science and Technology, China	<b>[O10B.02]</b> <b>Application of pulsed electric field during the electrodialysis of polymer-flooding produced water: Effects on performance and fouling</b> P.A. Sosa-Fernandez* <sup>1,2</sup> , J.W. Post <sup>2</sup> , H. Bruning <sup>1</sup> , F.A.M. Leermakers <sup>1</sup> , H.H.M. Rijnaarts <sup>1</sup> , <sup>1</sup> Wageningen University and Research, The Netherlands, <sup>2</sup> Wetsus, The Netherlands	<b>[O10C.02]</b> <b>Towards RED efficient integration into a SWRO desalination plant</b> C. Tristán*, M. Fallanza, R. Ibañez, I. Ortiz, University of Cantabria, Spain
11:45-12:00		<b>[O10B.03]</b> <b>Boosting the interfacial polymerization success rate by single-step PEC hollow fiber fabrication</b> M. Mohammadifakhr*, J. de Groot, A.J.B. Kemperman, H.D.W. Roesink, University of Twente, The Netherlands	<b>[O10C.03]</b> <b>Comparison of fouling characteristics between reverse electrodialysis (RED) and pressure retarded osmosis (PRO)</b> J.H. Ju*, Y.K. Park, J.H. Choi, Y.J. Choi, S.H. Lee, Kookmin University, Republic of Korea
12:00-12:15			<b>[O10C.04]</b> <b>A review on the performance of commercially available membranes in combined desalination and power generation process</b> F. Mahmoudi*, A. Date, A. Akbarzadeh, RMIT University, Australia
<b>12:15-13:00</b>	Lunch   Room: Orion/Pleiades Room		
<b>13:00-14:15</b>	<b>Session 11A: Forward osmosis</b>	<b>Session 11B: Materials and fabrication</b>	<b>Session 11C: Fouling</b>
Session Chair	<b>Ho Kyong Shon and Nurul Syahidah Zafisah</b>	<b>Raed Hashaikeh and Joanna Kujawa</b>	<b>Tom Pankratz and Akhilendra Bhushan Gupta</b>
13:00-13:15	<b>[O11A.01]</b> <b>Hybrid cake filtration/forward osmosis process: Assessment of nutrient recovery in palm oil mill effluent digestate</b>	<b>[O11B.01]</b> <b>Separation of multicomponent liquid systems containing non-volatile components by a new type of polymeric membranes</b>	<b>[O11C.01]</b> <b>Foulant analysis of RO membranes used in treating Rajasthan groundwater</b>

	N.S. Zafisah* <sup>1</sup> , A.W. Mohammad <sup>1</sup> , W.L. Ang <sup>1</sup> , N. Hilal <sup>2</sup> , <sup>1</sup> Universiti Kebangsaan Malaysia, Malaysia, <sup>2</sup> Swansea University, UK	J. Kujawa* <sup>1</sup> , B. Al-Omari <sup>2</sup> , S. Al-Gharabli <sup>2</sup> , W. Kujawski <sup>1</sup> , <sup>1</sup> Nicolaus Copernicus University in Torun, Poland, <sup>2</sup> German Jordanian University, Jordan	B. Agnihotri, A. Sharma, A.B. Gupta*, Malaviya National Institute of Technology Jaipur, India
13:15-13:30	<b>[O11A.02]</b> <b>Novel crosslinked layer by layer modification of forward osmosis membranes for enhanced separation performance</b> W. Suwaileh* <sup>1</sup> , D. Johnson <sup>1</sup> , S. Khodabakhshi <sup>1</sup> , N. Hilal <sup>1,2</sup> , <sup>1</sup> Swansea University, UK, <sup>2</sup> New York University Abu Dhabi, United Arab Emirates	<b>[O11B.02]</b> <b>Chemically-reinforced thin film nanocomposite membranes with enhanced physicochemical properties during water softening</b> L. Ndlwana*, B.B. Mamba, M.M. Motsa, University of South Africa, South Africa	<b>[O11C.02]</b> <b>Evaluating the modeling applicability of optical coherence tomography for membrane fouling</b> S. Park*, J. Park, K. Cho, Ulsan National Institute of Science and Technology, Republic of Korea
13:30-13:45		<b>[O11B.03]</b> <b>The application of MWCNT membranes for direct solar desalination in a continuous flow setting</b> A. Alshareif, I. Mustafa*, F. Almarzooqi, Khalifa University, United Arab Emirates	<b>[O11C.03]</b> <b>Laboratory study of the synergistic effect of electrocoagulation and electro-Fenton pre-treatment processes in silica removal to prevent reverse osmosis membrane fouling</b> F. Djouider, King Abdulaziz University, Saudi Arabia
<b>13:45-14:15</b>	<b>Closing remarks</b>		
<b>14:15</b>	<b>Conference ends</b>		