

Curriculum Vitae - Michael Owen

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Dual British / South African citizen

Personal profile

I am a senior lecturer and researcher in engineering specializing in heat transfer and fluid dynamics. I have been involved in research relating to the performance and operation of large scale mechanical draft air-cooled steam condensers (ACCs) for power plant applications since 2007.

After completing my studies in 2013 I spent time travelling abroad and am now working in academia at Stellenbosch University's Department of Mechanical and Mechatronic Engineering where I teach at undergraduate and postgraduate level and conduct research in power plant cooling systems (wet, dry and hybrid), solar thermal energy, fundamental heat transfer and fluid dynamics.

Education

PhD (engineering), December 2013

Stellenbosch University

- Dissertation: Air-cooled condenser steam flow distribution and related design considerations

MScEng (mechanical engineering), March 2010

University of Stellenbosch

- Cum laude
- Dissertation: A numerical investigation of air-cooled steam condenser performance under windy conditions

BEng (mechanical engineering), December 2007

University of Stellenbosch

- Cum laude
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Journal publications

- Reuter, H., Owen, M., Goodenough, J., *The Antifouling Effects of Copper-Oxide Filler Incorporated Into Paint-Based Protective Films Applied to Steam Surface Condenser Tubes*, Journal of Thermal Science and Engineering Applications, 10(4), 2018.
 - Owen, M.T.F., Kröger, D.G., *A numerical investigation of vapor flow in large air-cooled condensers*, Applied Thermal Engineering, 127, pp. 157-164, 2017.
 - Reuter, H., Owen, M., Goodenough, J., *Experimental evaluation of the temporal effects of paint-based protective films on composite fouling inside admiralty brass and titanium steam surface condenser tubes*, Applied Thermal Engineering, 126, pp. 848-857, 2017.
 - Owen, M.T.F., Kröger, D.G., Reuter, H.C.R., *Enhancing dry-cooled power plants using a hybrid (dry/wet) dephlegmator*, Heat Transfer Engineering, 38, pp. 1089-1100, 2017.
 - Owen, M.T.F., Kröger, D.G., *Contributors to increased fan inlet temperature at an air-cooled steam condenser*, Applied Thermal Engineering, 50, 2013.
 - Owen, M.T.F., Kröger, D.G., *An investigation of air-cooled steam condenser performance under windy conditions using computational fluid dynamics*, Journal of Engineering for Gas Turbines and Power, 133 (6), 2011.
 - Owen, M.T.F., Kröger, D.G., *The effect of screens on air-cooled condenser performance under windy conditions*, Applied Thermal Engineering, 30 (16), pp. 2610-2615, 2010.
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Conference and other research outputs

- Piessou, C., Lubkoll, M., Owen, M., *Pre-feasibility analysis of incorporating non-concentrating solar thermal energy systems in the Kenyan tea industry*, 5th South African Solar Energy Conference, Durban, 2018.
- Owen, M.T.F., Kröger, D.G., *A numerical investigation of vapor flow in large air-cooled condensers*, IAHR Industrial Cooling Towers Conference, Lyon, 2017.
- Reuter, H., Owen, M., Goodenough, J., *Experimental evaluation of the temporal effects of paint-based protective films on composite fouling inside admiralty brass and titanium steam surface condenser tubes*, IAHR Industrial Cooling Towers Conference, Lyon, 2017.
- Graaf, A.H., Owen, M.T.F., Reuter, H.C.R., *Experimental investigation of critical air flow and bundle wetting in a delugable plain tube bundle*, IAHR Industrial Cooling Towers Conference, Lyon, 2017.
- Graaf, A.H., Owen, M.T.F., Reuter, H.C.R., *A hybrid (dry/wet) cooling system for the HVAC industry: concept description and performance evaluation*, IAHR Industrial Cooling Towers Conference, Lyon, 2017.
- Owen, M.T.F., Kröger, D.G., Reuter, H.C.R., *Enhancing dry-cooled power plants using a hybrid (dry/wet) dephlegmator*, Proceedings of the 17TH IAHR Cooling Tower and Heat Exchanger Conference, Queensland, Australia, 2015.
- Owen, M.T.F., Kröger, D.G., *A hybrid dephlegmator for incorporation into an air-cooled steam condenser*, Proceedings of the International Conference on Applied Energy, Pretoria, 2013.
- Owen, M.T.F., Kröger, D.G., *Fan inlet temperature considerations at an ACC*, 1st South African Solar Energy Conference, Stellenbosch, 2012.
- Maulbetsch, J.S., Di Filippo, M.N., Owen, M.T.F., Kröger, D.G., *Wind effects on air-cooled condensers for power plant cooling*, 14th International Conference on Heat Transfer, pp. 809-816, Washington DC, USA, 2010.
- Owen, M.T.F., Kröger, D.G., *A Numerical Investigation Of Air-Cooled Steam Condenser Performance Under Windy Conditions*, Proceedings of the 14TH IAHR Cooling Tower and Heat Exchanger Conference, Paper OPO2, University of Stellenbosch, Stellenbosch, South Africa, 2009.

Post-graduate supervision record

PhD Graduates

2016 John Goodenough (co-supervisor with H Reuter in final year only)

“The effects of paint-based protective films on the actual temporal water-side performance characteristics of steam surface condenser tubes”

MEng (Research) Graduates

2017 Andre Graaf (co-supervisor with H Reuter in final year only)

“Performance evaluation of a hybrid (dry/wet) cooling system”

Michael Budler (co-supervisor with H Reuter in final year only)

“Theoretical modelling, design, and testing of a novel low pressure spray sprinkler for travelling agricultural irrigation systems”

2019 Simon Marincowitz (co-supervisor with J Muiyser)

“An experimental investigation on the effect of wind screens on air-cooled condenser fan performance and dynamic blade loading”

PhD current supervision

2018 – 2020 Jacques du Plessis

An experimental and modelling approach for the design considerations of a hybrid dephlegmator

2018 – 2020 Daniel Roux

Annual performance modelling and monitoring of wet cooling towers

2019 – 2021 Simon Marincowitz

Dynamic blade loading and fluid structure interactions in large power plant cooling system fans

MEng (Research) current supervision

2018 – 2019 Adam Venter (co-supervisor with J Muiyser)

A numerical investigation on the effect of wind screens on air-cooled condenser fan performance

2018 – 2019 Alex Ham (co-supervisor with M Venter)

A non-symmetrical hydrofoil capable of changing shape for yacht racing

2018 – 2019 Carl Kohrs

An investigation of cooling tower fill performance for Eskom's tower fill refurbishment program

MEng (Structured) current supervision

2017 – 2019 Claude Piessou (co-supervisor with M Lubkoll)

A prefeasibility analysis of incorporating non-concentrating solar technologies in the Kenyan tea industry

2018 – 2019 David Raphael

The influence of sheeting profile and mounting clearance on the thermal behavior and electrical performance of roof mounted solar panels

2018 – 2019 Scott Sullivan

Energy efficiency measures in the South African built environment: a road map for improved return on investment

2019 – 2020 Murray Starr

The feasibility of replacing oil fuel with concentrating solar energy in Middle Eastern thermal power plants

Employment history and experience

Department of Mechanical and Mechatronic Engineering, Stellenbosch University – Thermofluids division

SENIOR LECTURER, May 2018 – present

LECTURER, January 2017 – April 2018

JUNIOR LECTURER, January 2016 – December 2016

PART-TIME LECTURER, July 2015 – December 2015

Lecturing post-graduate heat transfer (Advanced Heat Transfer 813), final year under graduate engineering heat transfer (Heat Transfer A414) and second year strength of materials (Strength of Materials W244). Presented the Material Science section of first year Strength of Materials in 2015 (Strength of Materials 143).

Supervision of post-graduate students (PhD and MEng) and final year Mechanical Engineering theses.

Researcher: industrial cooling systems (wet, dry and hybrid), solar thermal energy, fluid dynamics.

After obtaining my PhD in December 2013 I took some time off to travel in Asia, northern Africa and Europe. During that time I worked for short periods in a variety of positions.

ASSISTANT CHALET HOST, December 2014 – April 2015

Peak Pursuits, St Martin de Belleville, France – Hospitality company offering fully catered ski chalet accommodation

Responsible for the general operation and upkeep of a 30 person ski chalet in the French Alps. Duties included catering, cleaning, maintenance, transportation and hosting.

GENERAL CONSTRUCTION, September 2014 – November 2014

Chalet 3 Valleys, St Laurent de le Cote, France – Hospitality company offering luxury self-catered ski chalet accommodation

Assisted with renovating an old building into a luxury ski chalet. General construction duties included assisting with planning and design, stone wall building, dry wall installation, flooring, carpentry, insulation, plumbing, electrics and demolition.

CARETAKER, July 2015 – August 2015

Animales des Orientes, Ceceda, Spain – Animal welfare organization for the benefit of abandoned and abused domestic and farm animals in the Asturias province of northern Spain.

Responsible for the general operation and upkeep of a smallholding where *Animales des Orientes* was based.

FREELANCE WRITER, December 2013 – March 2014

Demand Media Studios, online – Media company providing online content for various websites.

Author of several articles relating to renewable energy and sustainability published on websites such as ehow.com and opposingviewsscience.com.

CONSULTANT, December 2013 – March 2014

Self employed, Cape Town, South Africa

Design report review and advice for Nuclear Structural Engineering.

Leadership, community involvement and awards

- Technical committee, 11th South African conference on Computational and Applied Mechanics, 2018
 - Member, South African Society for Engineering Education, 2016/2017
 - Reviewer, 2015 - present
 - Applied Energy
 - Applied Thermal Engineering
 - International Journal for Heat and Mass Transfer
 - International Journal of Thermal Sciences
 - Journal of Mechanical Engineering Research
 - Journal of Thermal Engineering
 - R&D Journal of the South African Institute of Mechanical Engineering
 - 16th International Heat Transfer Conference, Beijing, 2018.
 - Chairman, *Stellenbosch River Festival* organizing committee, 2011/2012.
 - Vice-Chair, Maties Canoe Club, 2011.
 - Development and racing officer, Maties Canoe Club, 2011.
 - Element Six and DST/NRF Medal for Academic Excellence, 2007.
 - Sasol Prize for best fourth year mechanical engineering student, 2007.
 - Kröger Book Prize for best final year project in thermodynamics, 2007.
 - SAIMEchE Prize for best final year project presentation, 2007
 - Student representative, South African Institute of Mechanical Engineers, 2006.
 - Head student leader, St Patrick's College Kimberley, 2003.
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INTERESTS

RESEARCH

My research to date has focused on the performance of large air-cooled condensers for thermal power plants. I have investigated both the air-side and steam-side performance of these systems using computational fluid dynamics (CFD). I therefore have expertise in the fields of fluid dynamics, CFD, heat transfer and thermodynamics.

I am currently also pursuing research in the fields of wet and hybrid cooling and solar thermal energy, as well as fluid dynamics relating to high performance racing yachts and paragliders. In addition, I am extremely interested in the fields of renewable energy, innovative energy systems and energy efficiency.

TEACHING

I have a passion for teaching and love the challenge of bringing a group of students to a higher level of understanding. I have come to value the teaching aspect of my current job more than the research element which has come as a surprise to me.

I have been involved in teaching undergraduate Heat Transfer (4th year ~ 180 students) for 3 years and Strength of Materials (1st and 2nd year ~ 600 and 250 students respectively) for 2 years. I have been the module coordinator for Heat Transfer A414 since 2016 and am responsible for all aspects of presenting the module: lectures, formative and summative assessments, incorporation of blended learning tools and administration.

I have a firm belief in the necessity for undergraduate lecturers to inspire creative and critical problem solving skills as well as create opportunities for students to gain the confidence necessary to apply those skills to any problem.

I enjoy and value traditional methods of teaching (lectures, tutorials, practicals) but would also like to explore different methods and tools (in a formal, academic manner) in an attempt to improve the learning experience of students in the present age. The use of technology and greater student-to-student learning are topics of particular interest to me.

PERSONAL

I am a keen and active outdoor enthusiast and enjoy alpinism, rock climbing, paragliding, mountain running, skiing, cycling, surfing, and adventure racing. Since returning to South Africa and a full time job I have managed to cycle across Bolivia (December 2015), compete in Adventure Racing World Series races (2017 in China and 2018 in South Africa), climb and fly in the Alps and Dolomites (July 2017) and climb Mt Kenya (Jan 2018) amongst several adventures closer to home.

References

- Dr Francois Louw

Project Engineer, Kelvion

Email: francois.louw@kelvion.com

- Dr Ryno Laubscher

Chief Research Officer – ATProm Research Unit, University of Cape Town

Email: ryno.laubscher@uct.ac.za

- Dr Thorsten Becker

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- Prof. Thomas Harms

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