



CENTRE FOR RENEWABLE AND SUSTAINABLE ENERGY STUDIES

10th RENEWABLE ENERGY POSTGRADUATE SYMPOSIUM

&

6th STERG SYMPOSIUM

Programme

17 & 18 July 2019

Knowledge Centre, Faculty of Engineering
Stellenbosch University



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



Programme

Day 1 – Wednesday, 17 July 2019

08h00 - 08h30	Registration: Tea & Coffee	
08h30 - 09h15	Opening and Keynote Session Chair: Dr Siziwe Zuma	Room: K302
08h30 - 08h45	Welcome and Opening	Prof S Mamphweli Director: CRSES
08h45 - 09h15	Keynote Address – The design and construction challenges of utility scale PV plants	Mr A Stegmann Scatec Solar
09h15 - 10h30	Session 1 – Solar PV, Energy Efficiency & Network Integration Chair: Dr Siziwe Zuma	Room: K302
09h15 - 09h30	Supply- and Demand-side Assessment of a Domestic Photovoltaic Off-Grid System	O Overen
09h30 - 09h45	Investigation of optimum conditions for the development of dye-sensitised solar cells with improved efficiency	C Ahia
09h45 - 10h00	A systems approach to understanding urban household energy-water nexus in Cape Town	Y Parker
10h00 - 10h15	Finite element analysis of nine-phase induction generator	A Sibanda
10h15 - 10h30	Value determination methodologies for ancillary services in the SA grid: a literature review	D de Waal
10h30 - 10h55	Tea & Coffee break	
10h55 - 12h10	Session 2 – Bio-energy / fuel Chair: Dr Zikhona Liganiso	Room: K302
10h55 - 11h10	Life cycle sustainability assessment of biomethane versus biohydrogen technologies, for vehicle fuel or for electricity?	P Masilela
11h10 - 11h25	Anaerobic digestion of waste sludge originating from a recirculating aquaculture system	N Rudzani
11h25 - 11h40	Bio-refineries as a sustainable tool to simultaneously address energy and food security: A Jerusalem artichoke perspective	P Maumela
11h40 - 11h55	Financial viability and economic risk assessment of biogas production in South Africa	B Nagel
11h55 - 12h10	The <i>in situ</i> extraction of volatile fatty acids from anaerobic digester systems	S Morison / G James

12h10 - 13h30	Lunch	
13h30 - 14h00	Keynote Address –Fourth Industrial Revolution and Renewables	Ms Kubeshnie Bhugwadin Eskom
14h00 - 15h15	Session 3 – Solar PV Chair: Ndamulelo Mararakanye	Room: K302
14h00 - 14h15	Photovoltaic Module Evaluation via the Application of a Characterized Xenon Arc Lamp Solar Simulator	J Nwodo
14h15 - 14h30	Optical, structural and thermal studies of metals sulphides nanoparticles thermalized from copper, lead and tin dithiocarbamate single source precursors complexes	M A Agoro
14h30 - 14h45	Investigation of Contact Potential difference at the interface layers of single junction amorphous silicon solar (a-Si:H) module.	G Osayemwenre
14h45 - 15h00	Structural, morphological and electrochemical analysis of hydrothermally fabricated binary palladium alloys for use as platinum free counter electrode in dye sensitized solar cells	N Zingwe
15h00 - 15h15	Synthesis, photophysical and electrochemical studies of N,N-bis(3,5-dimethylpyrazol-1-yl-methyl)-heterocyclic-bipyridine-thiocyanato-ruthenium(II) complexes	S Adjogri
15h15 - 15h40	Tea & Coffee break	
15h40 - 16h55	Session 4 – Bio-energy / fuel Chair: Dr Irene Mabuda	Room: K302
15h40 - 15h55	Bio-hydrogen production potential of Rhodospseudomonas palustris by photo-fermentation of steam explosion pretreated lignocellulose biomass	L Mabutyana
15h55 - 16h10	Application of industrial amyolytic yeast strains for the production of bioethanol from rice waste	M Myburgh
16h10 - 16h25	The effect of the Ethiopian Government investing in the green economy using Biomass in the economy of Ethiopia 2005-2016	S Zuma
16h25 - 16h40	The enzymatic degradation of technical lignin into monolignols suitable for fuel production	B Mejeke
16h40 - 16h55	Closure	
18h30 - 21h45	Dinner @ Brampton	

Day 2 – Thursday, 18 July 2019

08h00 - 08h30	Registration: Tea & Coffee	
08h30 - 09h15	Keynote Session Chair: Prof S Mamphweli	Room: K302
08h30 - 08h45	Welcome and Opening	Prof T Harms Director: STERG
08h45 - 09h15	<i>Keynote Address</i> – An introduction to SolarPACES and an overview of the status, trends and developments in the global CSP markets	Mr V Rajpaul / Mr S Xosa SolarPACES
09h15 -09h45	Panel session – Bridging Innovation and Commercial Viability Chair: Prof S Mamphweli	Room: K302
09h15 - 09h25	TIA	Mr C Silinga
09h25 - 09h35	InnovUS	Mr J De Wet
09h35 - 09h45	Panel discussion	
09h45 -10h45	Session 1 – Techno-economic Analysis & Network Integration Chair: Prof Thomas M Harms	Room: K302
09h45 - 10h05	Dispatchable power requirement for South Africa – 2030 to 2050	S Clark
10h05 - 10h25	Techno-economic evaluation of long-term energy storage options for CSP and other Variable Renewable Energy in South Africa	J Burger
10h25 - 10h45	A techno-economic analysis of parabolic trough CSP plants for profitability enhancement	N Ollier
10h45 - 11h10	Tea & Coffee break	

(Parallel sessions)

11h10 - 12h50	Session 2A – Optics and Unmanned Aerial Vehicles Chair: Dr W Smit	Room: K302
11h10 - 11h30	Suitability of HelioPod facet for Azelio CSP tower	M Bonfanti
11h30 - 11h50	Towards a generalizable methodology to limit the effects of soiling for heliostats sited near a ferromanganese smelter	M Swart
11h50 - 12h10	Calibration of a modular dish design using lunar flux mapping	J Swanepoel
12h10 - 12h30	State estimation of multirotor drones	V van der Merwe
12h30 - 12h50	Design of unmanned aerial vehicle for heliostat field cleaning purposes	V Herrera
12h50 - 14h00	Lunch	
14h00 - 14h30	Keynote Address – Solar @ UP: Recuperated solar-dish Brayton cycle with turbocharger and short-term thermal storage	Dr W le Roux University of Pretoria
14h30 - 15h50	Session 3A – Gas Power Cycles & Turbomachinery Chair: Prof Johan van der Spuy	Room: K302
14h30 - 14h50	Optimisation of a supercritical carbon dioxide (sCO ₂) concentrated solar power (CSP) system	R van der Westhuizen
14h50 - 15h10	Solar@UP: Recuperated solar-dish Brayton cycle	Dr W Le Roux
15h10 - 15h30	Clamped plate-style recuperator with high temperature sealant; modelling, design and experimental testing	K Dellar
15h30 - 15h50	Simulation of solar gas turbine performance under off-design conditions	M Meas
15h50 -16h15	Tea & Coffee break	15h45 -16h10

(Parallel sessions)

Session 2B – Energy Storage		Room: K303
11h10 - 12h50	Chair: Dr Johann Strauss	
11h10 - 11h30	Dry gravity energy storage	C Botha
11h30 - 11h50	Battery energy storage system placement along medium voltage feeders	C Rhoda
11h50 - 12h10	The benefits of a pump storage in the South African Grid1	C van Dongen
12h10 - 12h30	A literature review on the energy storage system technologies, services and grid integration frameworks	J Bierman
12h30 - 12h50	A practical guide to kernel construction for renewable energy Bayesian inference	F Lubbe
12h50 - 14h00	Lunch	
14h00 - 14h30	Keynote Address – Solar @ UP: Recuperated solar-dish Brayton cycle with turbocharger and short-term thermal storage	Dr W le Roux University of Pretoria
Session 3B – Industrial Process Heat		Room: K303
14h30 - 15h50	Chair: Dr Matti Lubkoll	
14h30 - 14h50	The evaluation of on sun solar thermal treatment of manganese pellets towards the concept of a solar sinter	S Hockaday
14h50 - 15h10	The development of a heat and mass transfer model for a shaft kiln to preheat manganese ore with hot air	S Sambo
15h10 - 15h30	Concentrating solar technology for the generation of high temperature process heat for industrial applications in South Africa: A pre-feasibility study in sustainable hydrogen production	S Moodley
15h30 - 15h50	Solar energy uptake and energy efficiency in mineral extraction and beneficiation industry: A review	L Chiloane
15h50 - 16h15	Tea & Coffee break	

(Parallel sessions)

16h15 - 17h15	Session 4A – Numerical modelling of cooling systems Chair: Dr M Owen	Room: K302
16h15 - 16h35	Feasibility study of once-through cooling for 50 MWe solar thermal power plant on/near the Orange River	A Kehinde
16h35 - 16h55	Numerical investigation of an air-cooled steam condenser using open-source software	A Siavhe
16h55 - 17h15	Numerical investigation into the effect of peripheral windscreens on air-cooled condenser fan performance under windy conditions	A Venter
17h15 -17h25	Closure: Room K302	
17h30 - 18h00	Cocktail Reception	
19h00 - 22h00	Dinner @ CRAFT	

(Parallel sessions)

Session 4B – Heat transfer in solar receivers		Room: K303
Chair: Prof T W von Backström		
16h15 - 17h15		
16h10 - 16h35	Design process of helically twisted tapes as a suitable insert for heat transfer enhancement for solar receiver tubes	Z Panchbhaya
16h35 - 16h55	The capability of a novel jet impingement heat transfer device for the application in future solar thermal receivers	D Erasmus
16h55 - 17h15	Computational investigation into using impinging jets with swirl to enhance the heat transfer in a solar cavity receiver	J Quick
17h15 -17h25	Closure: Room K302	
17h30 - 18h00	Cocktail Reception	
19h00 - 22h00	Dinner @ CRAFT	

The Centre for Renewable and Sustainable Energy Studies, and the Solar Thermal Energy Research Group wish to thank our sponsors for their support in the 10th Renewable Energy Postgraduate Symposium and 6th Annual STERG Symposium

