8th RENEWABLE ENERGY POSTGRADUATE SYMPOSIUM

and

5th Annual STERG SolarPACES SYMPOSIUM

Programme

12, 13, 14 JULY 2017

Knowledge Centre, Faculty of Engineering
Stellenbosch University

STERG
SOLAR THERMAL ENERGY RESEARCH GROUP

science & technology
Department: Science and Technology
REPUBLIC OF SOUTH AFRICA

NRF National Research Foundation

Programme
Day 1 – Wednesday, 12 July 2017

08h00 - 08h30	Registration, Tea & Coffee	
	Session 1 – Solar PV **Chair: Prof E van Dyk – Room: K302**	
08h30 - 08h45	Opening Session	Prof JL van Niekerk
08h45 - 09h15	*Keynote Address* - An insight into the future of the Centre for Renewable and Sustainable Energy Studies at Stellenbosch University	Prof S Mamphweli
09h15 - 09h30	Questions/discussion	
09h30 - 09h50	Application of Genetic Algorithm Parameter Optimisation on Current-Voltage data of poly-crystalline Silicon solar cells	RM Dix-Peek
09h50 - 10h10	Confocal Raman characterization of sputter coated TiO2 nanotubes on functional substrate	S Zinya
10h10 - 10h30	Synthesis and characterization of C-TIO2 nanotubes using a template-assisted sol-gel technique.	N Takata
10h30 - 10h50	Morphological, Structural and Optical Characterization of CdSe quantum dots	S Makinana
10h50 - 11h10	Mono-crystalline silicon cell degradion analysis	G Osayemwenre
11h10 - 11h30	Tea & Coffee	
	Session 2 – Solar thermal **Chair: Prof S Mamphweli – Room: K302**	
11h30 - 11h50	Correlative data Acquisition System for a building integrated Photovoltaic system	C Buma

11h50 - 12h10	Opaque Components Solar Heat Gain Analysis of a Passive Solar House	O Overen
12h10 - 12h30	Analytical Evaluation of the Energy Losses at High Ambient Temperatures during the Duty Cycle of a Residential Heat Pump Water Heater	N Joel
12h30 - 12h50	Simple payback period evaluation upon replacement of a domestic traditional with a domestic renewable space conditioning device	B Glory
12h50 - 13h30	Lunch	
	Session 3 – Wind, bioenergy & policy **Chair: Dr E van Rensburg – Room: K302**	
13h30 - 13h50	Modelling the potential for urban wind energy in Cape Town	M Gough
13h50 - 14h10	Design and fabrication of a biogas fermentation system	O KeChrist
14h10 - 14h30	Steam pretreatment and fermentation scenarios for a sugarcane biorefinery	M Hamann
14h30 - 14h50	Bio-refineries as a sustainable tool to simultaneously address energy and food security: A Jerusalem artichoke perspective	P Maumela
14h50 - 15h10	Tea & Coffee	
	Session 4 – Policy **Chair: Dr B Bekker – Room: K302**	
15h10 - 15h30	Sustainability assessment of technology systems that addresses the energy-water nexus; with specific emphasis on desalination	L Swart
15h30 - 15h50	A systematic literature review of hybrid renewable energy micro-grids in South Africa and neighbouring countries	M Mabaso

15h50 - 16h10	A radio frequency identification (RFID) energy efficiency model for residential buildings	O Obafemi
16h10 - 16h20	Closing	
18h30 - 21h45	Dinner	

Day 2 – Thursday, 13 July 2017

08h00 - 08h30	Registration, Tea & Coffee	
	Session 1 – Opening & Keynote – Room: K302	
08h30 - 08h45	Welcome	Prof J vd Spuy
08h45 - 09h00	Introduction to STERG research group	Prof J vd Spuy
09h00 - 09h30	*Keynote Address* – Energy Modeling for South Africa, Latest Approaches and Results in a Rapidly Changing Energy Environment	Dr T Bischof-Niemz - CSIR
	Session 2 – Update on research activities by partners **Chair: Prof J van der Spuy – Room: K302**	
09h30 - 09h55	The latest on DNI and Diffuse measurements options	Riaan Meyer – GeoSun
09h55 – 10h20	An Update on Research Activities at the Group for Solar Energy Thermodynamics	J Pitot
10h20 – 10h35	Tea & Coffee	

(Parallel sessions)

Session 3A – Plant modelling Chair: Dr J Hoffmann - Room: K302		
10h35 - 10h55	Performance of a SUNDISC cycle CSP plant for off-grid baseload applications	L Heller
10h55 - 11h15	Simulations showing how the SUNSPOT system cycle improves on conventional combined cycle technology	JL Janse van Vuuren
11h15 - 11h35	An Organic Rankine Cycle as technology for Smaller Concentrated Solar Powered Systems	L Karsten
11h35 - 11h55	Simulation, Verification and Optimisation of a Parabolic Trough Power Plant	R Barnes
11h55 - 12h15	Dynamic Modelling of the HPS2 CSP molten salt trough test facility	R Temlett
12h15 - 12h35	Identification of optimum molten salts for use as heat transfer fluids in parabolic trough plants. A techno-economic comparative optimization	C Pan
12h35 - 13h30	Lunch	
13h30 - 14h00	*Keynote Address* – CSP Status in the country	Alberto Cuellar – Mott Macdonald
Session 4A – Central receiver Chair: Dr M Lubkoll – Room: K302		
14h00 - 14h20	Performance prediction of the SCRAP receiver	M Lubkoll
14h20 - 14h40	Preliminary investigation into central receiver design for optimal optical and thermal performance	M Slootweg
14h40 - 15h00	Computational fluid dynamics modelling of a recessed open volumetric receiver configuration	M Jo Mathew
15h00 - 15h20	Development of an open volumetric air receiver for a rock-bed thermal energy storage system	JC Nel
15h20 - 15h40	Receiver testing for an open solar-thermal Brayton cycle	T Wolff

(Parallel sessions)

Session 3B – Heliostats, optics & drones Chair: Dr W Smit - Room: K303		
10h35 - 10h55	Preliminary investigation into two-way fluid structure interaction of heliostat wind loads	JR Wolmarans
10h55 - 11h15	Investigation, evaluation and selection of optimal bearings to be employed in a newly designed heliostat	A Lötter
11h15 - 11h35	An Investigation into the use of light diffraction for the closed-loop control of heliostats	M Claassen
11h35 - 11h55	Adaptive Control for a Quadcopter	E Niit
11h55 - 12h15	An Investigation into Gimbal Pose Accuracy: The Accuracy of the Gimbal Model in the Frequency Domain	M Haller
12h15 - 12h35	Object Avoidance with Optic Flow	C Craye
12h35 - 13h30	Lunch	
13h30 - 14h00	-	-
Session 4B – Thermal modelling, storage modelling & heat engines Chair: TM Harms – Room: K303		
14h00 - 14h20	One-dimensional transient filling simulation of a molten salt central receiver panel	J Swart
14h20 - 14h40	Commissioning of an Experimental Test Facility for Thermal Energy Storage in a Packed Bed of Rocks	H Laubscher
14h40 - 15h00	Design and manufacture of a testable 100We dual generator free piston Stirling engine	JG de la Bat
15h00 - 15h20	The development of a reciprocating steam engine for use in small scale CSP plants	B da Silva
15h20 - 15h40	-	-

(Parallel session)

15h40 – 15h55	Tea & Coffee	
	Session 5A – Systems modelling & policy **Chair: Prof TM Harms – Room: K302**	
15h55 - 16h15	Review: State of the art parabolic trough technology and the way moving forward	R Laurie
16h15 - 16h35	Solar live steam generation and solar bagasse drying for South African sugar mills	W Krog
16h35 - 16h55	Solar thermal treatment of manganese ore fines	L Hockaday
16h55 - 17h05	Closing	Prof J van der Spuy
17h05 - 17h45	Cocktail Reception	
18h30 - 22h00	Dinner	

(Parallel session)

15h40 – 15h55	Tea & Coffee	
	Session 5B – Parabolic trough & process heat **Chair: Dr B Bekker – Room: K303**	
15h55 - 16h15	Future CSP in South Africa – a review of electricity (generation) mix models and their results	F Duvenhage
16h15 - 16h35	A strategic management framework for the commercialisation of concentrating solar power technologies in South Africa	G Prentice
16h35 - 16h55	-	-
	End of Session	

Day 3 – Friday, 14 July 2017

08h00 - 08h30	Registration, Tea & Coffee	
	Session 1 - Chair: Prof J van der Spuy – Room: K302	
08h30 - 08h40	Welcome	Prof J van der Spuy
08h40 - 09h10	NamPower CSP development	Gordon Gadney
09h10 - 09h40	*Keynote Address* – Potential of CSP with focus on Namibia and the region	Margaret Mutschler – Mutschler Consulting Services
09h40 - 10h00	MiniWaterCSP	Prof J van der Spuy
10h00 - 10h15	Project Finance for CSP in Africa	Ian Poole - Nedbank
10h15 - 10h45	STASA	Terence Govendar
10h45 -11h00	Tea & Coffee	
	Session 2 - Chair: Prof JL van Niekerk – Room: K302	
11h00 - 11h30	Abengoa Solar	Julian Lopez Garrido
11h30 - 12h00	SolarReserve	Terence Govender
12h00 - 12h30	ACWA	Nandu Bhula
12h30 - 13h00	Panel Discussion & Closing	Prof JL van Niekerk
13h00 - 14h00	Lunch	
14h00 - 16h30	Thermal Storage / SUNREC Technical Tour	