

Day 1: Monday 31 October 2016

1.1 Opening Session (09h00 - 10h00) - Attie van Wijk Auditorium

Chair: Prof Wikus van Niekerk

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| 09h00 | Introduction | Prof Wikus van Niekerk |
| 09h10 | Welcome to Stellenbosch University | Prof Wim de Villiers |
| 09h25 | Welcome to Stellenbosch: Mayor's Office | Adv Gesie van Deventer |
| 09h40 | Opening Address: Department of Science and Technology | Mr Mmboneni Muofhe |

Tea Break (10h00 - 10h30)

1.2 Plenary Session (10h30 - 12h30) - Attie van Wijk Auditorium

Chair: Prof Ernest van Dyk

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| 10h30 | Towards fluctuating distributed generation: A system perspective | Prof Carsten Agert (Keynote Speaker) |
| 11h10 | Solar PV resource for higher penetration through a combined spatial aggregation with wind | Tobias Bischof-Niemz, Crescent Mushwana |
| 11h30 | Classification of Electroluminescence Imaging Results for Large-scale PV Quality Testing | Jacqui Crozier, Ernest van Dyk, Frederik Vorster |
| 11h50 | Regionalized Energy System Model | Ulrich Wagner, Tobias Schmid |
| 12h10 | Long term Irradiance Clear Sky Model Validation | Pierre Ineichen |

Lunch Break (12h30 - 13h30)

1.3a Solar Thermal (13h30 - 15h10) - Attie van Wijk Auditorium

Chair: Dr Willem le Roux

1.3b Solar PV (13h30 - 15h10) - Room 1006

Chair: Dr Freddie Vorster

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| 13h30 | Thermodynamic Analysis and Optimisation of a Stirling Engine in Terms of Dead Volume | James A Will, Tunde Bello-Ochende, | 13h30 | Investigation of the series resistance of an operational photovoltaic system | Petja Dobrova, Ernest van Dyk, Frederik Vorster |
| 13h50 | Increasing the temporal resolution of direct normal solar irradiance data using the South African Universities Radiometric Network | Ian Poole, Frank Dinter | 13h50 | Solar Array Emulator System | Takudzwa Tapfumanei, H du Toit Mouton, Arnold J Rix |
| 14h10 | Development of a High Concentration Solar Flux Sensor | Brandon van Bakel, Michael Brooks, Jean-Francois Pitot de la Beaujardiere | 14h10 | Photovoltaic System Modelling Using PVLlib | Tafadzwa Gurupira, Arnold Rix |
| 14h30 | Experimental energy and exergy analyses of a discharging heat extraction device for a small oil storage tank | Ashmore Mawire | 14h30 | Voltage Dependent Electroluminescence of Crystalline Silicon Photovoltaic cells | Ross Dix-Peek, Jacqueline Crozier, Frederik Vorster, Ernest van Dyk |
| 14h50 | High Temperature Energy Storage in a Rock-bed test facility | Luis Guerreiro, Kenneth Allen, Henk Laubscher, Frank Dinter | 14h50 | Energy yield performance of different Photovoltaic technologies using high temporal resolution performance data. | Ross Schultz, Grant Woodford, Frederik Vorster, Ernest van Dyk |

Coffee Break (15h10 - 15h30)

1.4a Solar Thermal (15h30 - 17h30) - Attie van Wijk Auditorium

Chair: Dr Paul Gauche

1.4b Solar PV (15h30 - 17h30) - Room 1006

Chair: Dr Arnold Rix

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| 15h30 | Opportunities for Concentrated Solar Process Heat in the Minerals Processing Industry | Lina Hockaday, Frank Dinter, Thomas Harms | 15h30 | Performance of a 558 kWp Single-Axis Tracking Solar PV System: Case Study in Pretoria, South Africa | Kittessa Roro, Tobias Bischof-Niemz, Manjunath Basappa Ayanna |
| 15h50 | Open Source Modeling of Solar Process Heat Systems | Corvin Ilchmann | 15h50 | Comparative performance analysis of different photovoltaic module technologies and system design configurations of PV systems operating in South Africa | Tshepo Joba Serameng, Kittessa T Roro, Ernest van Dyk |
| 16h10 | HYDROSOL: A low cost space heating and cooling system | Johan Terblanche, Kenneth Allen, Hanno Reuter | 16h10 | Power-system-wide analysis of the benefits of reserve provision from solar photovoltaics in South Africa | Tobias Bischof-Niemz, Joanne Calitz, Jarrad Wright |

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| 16h30 | Large-Scale Solar Thermal in South Africa | Eugene Joubert, Stefan Hess, Wikus Van Niekerk | 16h30 | Optimization of the size of an embedded solar PV plant to maximise the self-consumption ratio while simultaneously achieving a high degree of self-sufficiency | Manjunath Basappa Ayanna, Tobias Bischoff-Niemz |
| 16h50 | Dynamic system modelling as a robust tool to evaluate the performance of domestic integrated and split type air source heat pump water heaters. | Stephen Tangwe, Michael Simon, Edson Meyer | 16h50 | Transient model of hybrid concentrated photovoltaic with thermoelectric generation | Sajjad Mahmoudi Nezhad, Lasse Aistrup Rosendahl, Alireza Rezaniakolaei |
| 17h10 | Development and Design of an Experimental Facility for cost effective Thermal Rock Bed Storage System | Henk Laubscher, Frank Dinter, Theodor Von Backström | 17h10 | Performance Analysis for a Photovoltaic System with Solar Tracking | Wesley Doorsamy, Willem Cronje |

Cocktail Event (18h00 - 20h00)

Elijah Mokhethi, Head of Energy at the TIA

Cédric Philibert, Senior Analyst, IEA

Day 2: Tuesday 1 November 2016

2.1 Plenary Session (8h30 - 10h00) - Attie van Wijk Auditorium

Chair: Prof Frank Dinter

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| 08h30 | The Opportunities for CSP in Chile and South Africa | Dr Werner Platzer (Keynote Speaker) |
| 09h10 | Solar energy in the electricity system of South Africa – Linking a detailed technology modelling with a large-scale energy system model | Christoph Kost, Chris Friebertshäuser, Niklas Hartmann |
| 09h30 | Representation of optical power variation from Parabolic Trough, Linear Fresnel and Scheffler-Reflector concentrating collectors for Solar Process Heat Systems | De Wet van Rooyen, Anna Heimsath, |
| 09h50 | Towards an International Guideline for Yield Analysis for Solar Thermal Power Plants | Markus Eck, Tobias Hirsch, |

Tea Break (10h10 - 10h30)

2.2 Plenary Session (10h30 - 12h30) - Attie van Wijk Auditorium

Chair: Werner Weiss

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| 10h30 | The Role of Regulatory Mechanisms to Advance Solar Technology Adoption and Deployment | Angelina Galiveta (Keynote Speaker) |
| 11h10 | Bayesian Variance Component Estimation for Evaluating Energy Yields | Chantelle Clohessy, Gary Sharp, Ernest van Dyk, Johan Hugo |
| 11h30 | View Factor of Solar Chimneys by Monte Carlo Method | Mojtaba Mirhosseini, Alireza Rezaniakolaei, Lasse Rosendahl |
| 11h50 | Light Filtered Concentrated Photovoltaic Thermal System | Ebrahim Elshik, Christiaan Bester, André Nel |
| 12h10 | Oil Based Solar Heat Collection and Storage | Ole Jorgen Nydal, Silje Fosseng Duley, Ragnhild Skahjem |

Lunch Break (12h30 - 13h30)

2.3a Concentrating Solar Power (13h30 - 15h10) - Attie van Wijk Auditorium

Chair: Prof Ken Craig

2.3b General Solar (13h30 - 15h10) - Room 1006

Chair: Dr Jaap Hoffmann

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| 13h30 | Introduction to heat transfer test setup and manufacturing processes for the SCRAP receiver | Matti Lubkoll, Theodor W von Backström, Thomas M Harms | 13h30 | Integrating desalination with CSP: large scale cogeneration of water and electricity | Ernest Dall, Jaap Hoffmann, |
| 13h50 | Performance prediction for a solar hybrid micro-gas turbine system | Brian Ssebabi, Frank Dinter, Johan van der Spuy | 13h50 | Application of Solar Powered Irrigation Systems in Botswana | Nametso Moumakwa, Prince Johnson, |
| 14h10 | Evaluation of existing strategies for the commercialization of multi-technology renewable energy systems: The case of CSP technologies in South Africa | Greg Prentice, Alan Brent, Imke de Kock | 14h10 | The financial impact of residential distributed generation on local governments in South Africa: A case study into Stellenbosch Municipality | Nikkie Korsten, Ben Sebitosi, Alan Brent |
| 14h30 | On the optimization of a central receiver system | Jaap Hoffmann | 14h30 | A review of freely available energy systems modelling tools and their use within the South African context | Mbalenhle Mabaso, Paul Gauché, Johannes L van Niekerk |
| 14h50 | High-temperature testing of an open-cavity tubular solar receiver | Willem Le Roux | 14h50 | The synthesis of lanthanide-cupferron type complexes as spectral converters for solar cells | Creten Moodley, Alfred Muller |

Coffee Break (15h10 - 15h30)

2.4a Concentrating Solar Power (15h30 - 17h30) - Attie van Wijk Auditorium

Chair: Thomas Roos

2.4b Heliostats (15h30 - 17h30) - Room 1006

Chair: Prof Ernest van Dyk

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| 15h30 | Improving the thermal and thermodynamic performance of parabolic trough receivers using Cu-Therminol® VP-1 nanofluid - Performance at different concentration ratios | Aggrey Mwesigye, Zhongjie Huan, Josua P Meyer | 15h30 | A Parametric Study of Heliostat Size for Reductions in Levelized Cost of Electricity | Arvind Sastry Pidaparathi, Dries Frank Duvenhage, Jaap Hoffmann |
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| 15h50 | Concentrated Solar Power for Sea Water Desalination in a Direct Absorption Solar Collector Using Carbon Black Additives | Johan Bester, Heinrich Badenhorst | 15h50 | A Method for Accurate Measurement of Heliostat Mirror Orientation | Benjamin Swart, Herman Engelbrecht, Johann Treurnicht |
| 16h10 | Structural analysis of dynamic response of HeliopOD under wind loading | Gerrie Delpont, Ken J Craig | 16h10 | Lumped method for calculating the optical efficiency of radially staggered heliostat fields | Jaap Hoffmann |
| 16h30 | Using RANS-LES formulations in the CFD modeling of heliostat peak loads | Pierre Poulain, Dawie Marais, Ken Craig | 16h30 | Potential gain through implementation of astigmatic corrected heliostats | De Wet van Rooyen, Peter Schöttl, Gregor Bern |
| 16h50 | Discretization methods for an etendue conserving compact linear Fresnel for peak and off-peak conditions | Ansuya Rungasamy, Ken Craig, Josua Meyer | 16h50 | Optimization of fixed focal length for Linear Fresnel Collector mirrors | Moahhamd Moghimi Ardekani, Ken Craig, Josua Meyer |
| 17h10 | Solar powered low grade heat Organic Rankine Cycle heat engine | Tisaye Kalua, Russell Phillips | 17h10 | | |

Conference Dinner (18h00 - 23h00)

18h30 Busses Depart for Cavalli Estate
19h00 Arrival and Drinks
19h30 Dinner
22h00 Announcements
22h30 Busses Depart for Stellenbosch

Day 3: Wednesday 2 November 2016

3.1 Plenary Session 3 (8h30 - 10h00) - Attie van Wijk Auditorium

Chair: Prof Wikus van Niekerk

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| 08h30 | Opportunities for Large-Scale Solar Technology Contributions to the World Energy Supply | Dr Dave Renne (Keynote Speaker) |
| 09h10 | Research and Development of Concentrator Photovoltaics (CPV) Systems at Nelson Mandela Metropolitan University | Ross Schultz, Ernest van Dyk, Frederik Vorster |
| 09h30 | Environmental impacts of utility scale PV and CSP in South Africa: A first survey of experts and stakeholders | Justine Rudman, Paul Gauché, Karen Esler |
| 09h50 | Rural community electrification business: lessons learnt from the SolarTurtle pilot | James van der Walt, Shanley Lutchman, Wikus van Niekerk |

Tea Break (10h10 - 10h30)

3.2a Energy Storage (10h30 - 12h10) - Attie van Wijk Auditorium

Chair: Prof Frank Dinter

3.2b Off Grid/Agri/Rural (10h30 - 12h30) - Room 1006

Chair: Dr Mike Brooks

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| 10h30 | Influences of Energy Throughput on the Life of Various Battery Technologies | Brian De Beer, Arnold Rix | 10h30 | Diaspora Financing, Developing a Strong Solar Industry on the Continent | Ignacio Smith, Sherry McMillan |
| 10h50 | Modelling a solar PV hydrogen production system | Gerhard Human, Dmitri Bessarabov | 10h50 | Reporting on the Electrification of Off-Grid, Rural Schools in the Eastern Cape | Akhona Yaso, Ross Schultz, Ernest van Dyk, Frederik Vorster |
| 11h10 | Performance and profitability of battery storage systems for mitigating solar power fluctuations | James Barry | 11h10 | A Novel Nature-Inspired Picogrid for Flexible PV Application in Rural Electrification Systems | Wesley Doorsamy, Willem Cronje |
| 11h30 | Thermal energy storage using phase change materials and graphite composites | Heinrich Badenhorst | 11h30 | Solar energy in agri-processing | Pieter Frederik Janse van Vuuren, Catherine Pineo, Lauren Basson |
| 11h50 | Combined mechanical and thermal loading of a hot air-packed rock bed -a test rig for thermal energy storage | Fady Elsayed | 11h50 | A novel indirect parabolic solar cooker | Omotoyosi Craig, Robert Dobson, Wikus van Niekerk |

Lunch Break (12h15 - 13h00)

Technical Tour (13h15 - 18h30)

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| 13h15 | Registration |
| 13h45 | Busses Depart for Mariendahl |
| 14h30 | Helio100 Pilot Plant, Mariendahl |
| 16h00 | Busses Depart for Spice Route/CBC |
| 16h30 | CBC Solar Thermal Plant |
| 17h00 | Beer Tasting |
| 18h00 | Busses Depart for Stellenbosch |