

# **Test and Measurement Conference 2015**

Cape Town, South Africa  
12-14 October 2015

ISBN: 978-1-5108-2000-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2015) by National Laboratory Association  
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact National Laboratory Association  
at the address below.

National Laboratory Association  
PO Box 298  
Persequor Park  
Pretoria 0020  
South Africa

Phone: 27 12 349 1500

Fax: 27 12 349 1501

[maggier@nla.org.za](mailto:maggier@nla.org.za)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)



# **Test and Measurement 2015**

## **Conference and Workshop**

### **FINAL PROGRAMME**

#### **Quality of Life – What is the measure of it?**

**Lord Charles Hotel, Somerset-West**

**Sunday 11<sup>th</sup> October 2015**

14h00 – 17h00	<b>Registration</b>
18h00 – 18h30	<b>Cocktails and Get together</b>
18h30 onwards	<b>Dinner</b>

Day One Monday 12<sup>th</sup> October 2015

07h45	<b>Registration and Coffee</b>			
Session Chairman				
Venue Room				
09h00	<b>Opening and Welcome</b>			
	<b>M101</b>			
09h15	<i>Andy Buffler</i> <i>Measuring for knowledge: Teaching the ISO-GUM in the modern introductory physics laboratory....1</i> <b>University of Cape Town</b>			
	<b>M102</b>			
10h00	<i>Jin Seog Kim</i> <i>Metrology for Quality of Life....11</i> <b>KRISS, South Korea</b>			
	<b>M103</b>			
10h45	<b>Tea/Coffee</b>			
Session Chairman				
Venue Room				
11h15	Annelie Swanepoel <i>Sampling for diatoms and bacteria from the epilithic biofilm on the inside wall of the water transfer tunnel between Lesotho and South Africa ....30</i> <b>Rand Water</b> <b>M104</b>	Lucky Ngidi <i>Energy metering: The challenges facing municipalities....N/A</i> <b>SALGA</b> <b>M204</b>	Linoh Magagula <i>Reliability of Using a Measuring Instrument at the Limits of its Specified Range....219</i> <b>NMISA</b> <b>M304</b>	Brigitte Language <i>Comparison of Respirable Particle Measurements from Direct-Reading Photometric Instruments and a Gravimetric Sampling Method....304</i> <b>North West University</b> <b>M404</b>
11h45	Jenny Reeves <i>The treatment of waste water for re-use in industry....43</i> <b>ESKOM</b> <b>M105</b>	Gerrit Barnard <i>Energy efficiency studies – Brief introduction about this subject....149</i> <b>Comtest (Pty) Ltd</b> <b>M205</b>	Dharmarai Naicker <i>The PPECB Laboratory goes green and lean....227</i> <b>PPECB</b> <b>M305</b>	Gerald Woollatt <i>Quality Assurance of Continuous Emission Monitoring Systems - Application of BS EN14181:2014 and BS EN 13284-2....314</i> <b>Levego</b> <b>M405</b>
12h15	Rahzia Hendricks <i>The Application of the SOS-Chromotest and the UMU-C assay to determine genotoxicity levels in wastewater effluents....57</i> <b>Rand Water</b> <b>M106</b>	Hein Erwin <i>Quality of life, or should we say quality of supply in our energy supply crisis....156</i> <b>KoCos Measurement &amp; Control</b> <b>M206</b>	Thomas Mautjana <i>The use of Z factors in gravimetric volume measurements....235</i> <b>NMISA</b> <b>M306</b>	Ilze Pretorius <i>A critical Comparison of Gaseous coal-fired Large Boiler emissions estimation in South Africa....323</i> <b>North West University</b> <b>M406</b>

12h45	<b>LUNCH – Exhibition Viewing</b>			
Session Chairman				
Venue Room				
13h30	<p>Kelley Reynolds-Clausen <i>The development of a simple test to indicate biocide efficacy....69</i> <b>ESKOM</b> <b>M107</b></p>	<p>Tshepo Serameng <i>Comparison of the Performance of Crystalline Silicon and Thin-film CIGS Technologies in South African Climatic Conditions....168</i> <b>ESKOM</b> <b>M207</b></p>	<p>Mpatuwa Mokhosi <i>The techniques of continually improving the quality system for ISO 17025 accredited laboratories....240</i> <b>Sedibeng Water</b> <b>M307</b></p>	<p>Mudalo Nemaadzhilli <i>Measurement equivalence for stack emission monitoring....336</i> <b>NMISA</b> <b>M407</b></p>
14h00	<p>Sibusiso Mnguni <i>Analysis of volatile organic compounds (VOCs) in the Vaal river regions of South Africa using a purge and trap technique followed by gas chromatography mass spectrometry (GC-MS)....N/A</i> <b>Rand Water</b> <b>M108</b></p>	<p>Clive Oliphant <i>Accurate characterisation of nanostructured thin films....179</i> <b>NMISA</b> <b>M208</b></p>	<p>Guy Snelling <i>Understanding the Data and True Value of a Calibration Certificate....252</i> <b>Intercal</b> <b>M308</b></p>	<p>Richard Sadiki <i>The role of stakeholders in the development of industry relevant national standards....346</i> <b>SABS</b> <b>M408</b></p>
14h30	<p>Gerhard Cilliers <i>The integration of in situ system variables and laboratory generated water quality data for effective management of the Berg River Estuary....77</i> <b>Department of Water Affairs</b> <b>M109</b></p>	<p>Manny Mathuthu <i>Testing of desulphurization effect in the Petroleum Industry ....187</i> <b>North West University</b> <b>M209</b></p>	<p>Hanlie Badenhorst <i>A lab perspective for effective assessments....262</i> <b>NLA</b> <b>M309</b></p>	<p>Sam Thema <i>Accreditation process for stack emission organizations....354</i> <b>SANAS</b> <b>M409</b></p>
15h00	<b>Tea/Coffee – Exhibition Viewing</b>			
Session Chairman				
Venue Room				
15h30	<p>Louis de Wet <i>The effects of toxic elements in water on human health....104</i> <b>Waterlab</b> <b>M110</b></p>	<p>Lawrence Rainbird <i>Test &amp; Calibration Benefits from a New Precision RF/Microwave Calibrator....203</i> <b>Fluke Calibration</b> <b>M210</b></p>	<p>Odetta Makobe <i>Continual improvement: Aligning Lean tools with ISO 17025 clauses to improve laboratory efficiency....271</i> <b>Sedibeng Water</b> <b>M310</b></p>	<p>Olebogeng Matshediso <i>Completing the regulatory puzzle- Development of an emissions compliance monitoring system for South Africa....362</i> <b>DEA</b> <b>M410</b></p>

<p>16h00</p>	<p>Christa Nel <i>Challenges in a high throughput ISO/IEC 17025 accredited water testing laboratory....126</i> <b>ERWAT</b> M111</p>	<p>Pamela Silwana <i>Validation of Proposal to Extend Frequency Scope of Attenuation and Voltage Reflection Coefficient Parameters to 67 GHz....212</i> <b>NMISA</b> M211</p>	<p>Neville Tayler <i>Lunacy and Metrology....284</i> <b>SANAS</b> M311</p>	<p>Quentin Hurt <i>Estimating uncertainty of measurement for isokinetic dust sampling....369</i> <b>SKYSIDE</b> M411</p>
<p>17h00</p>	<p><b>Sponsored Cocktails</b></p>			
<p>18h00</p>	<p><b>Dinner</b></p>			

Day Two Tuesday 13<sup>th</sup> October 2015

07h45	<b>Registration and Coffee</b>			
Session Chairman				
Venue Room				
09h00	Marena Manley <i>Near infrared (NIR) spectroscopy for reliable measurements....376</i> <b>University of Stellenbosch</b>			<b>T101</b>
09h45	Steve Sidney <i>The NLA-SA in 2015!! ....410</i> <b>NLA</b>			<b>T102</b>
10h30	<b>Tea/Coffee and Manned Poster Session</b>			
Session Chairman				
Venue Room				
11h00	Joseph van Houten <i>SANS 3001 Nuclear Density Gauge methods – calibration vs verification - who needs to do what?....419</i> <b>SANRAL</b> <b>T103</b>	Ray Jenkins <i>Establishing a Force and Torque Laboratory that meets the requirements of ISO 17025....508</i> <b>Emirates Metrology Institute</b> <b>T203</b>	Adriaan van Brakel <i>"The Light Stuff": Improving Quality of Life with Photonics....562</i> <b>NMISA</b> <b>T303</b>	Chair: Maria Fernandes-Whaley <i>Food CRMs – Needs Analysis Workshop....602</i> <b>NMISA</b> <b>T403</b>
11h30	Barry Pearce <i>Asphalt PTS feedback....429</i> <b>Learning Matters cc</b> <b>T104</b>	Sipho Dlamini <i>Characteristics and functions of the South African national measuring standard for force....523</i> <b>NMISA</b> <b>T204</b>	Irma Kruger <i>Investigation of the stability of red, amber and green lights of a prototype railway signalling assembly with led arrays....570</i> <b>NMISA</b> <b>T304</b>	
12h00	Sean Strydom <i>GUM vs 3001-PR1....440</i> <b>SANRAL</b> <b>T105</b>	Michael Khoza <i>How to make precise capacitance and inductance measurements using an LCR meter ....531</i> <b>NMISA</b> <b>T205</b>	Gavin van Rooy <i>Temperature Transmitter Calibration - the challenges!....577</i> <b>Comtest (Pty) Ltd</b> <b>T305</b>	
12h30	<b>LUNCH – Exhibition Viewing</b>			

Session Chairman				
Venue Room				
13h30	Johan van Wyk <i>Points to ponder on for readymix concrete testing....450</i> <b>SARMA</b> T106	Oelof Kruger <i>NMISA's Length section: New calibration and research services....538</i> <b>NMISA</b> T206	Regina Mnguni <i>Measurement results and drift analysis of a relative humidity meter used for temperature range, 5 °C to 55 °C, at the NMISA....585</i> <b>NMISA</b> T306	Chair: Maria Fernandes-Whaley <i>Food CRMs – Needs Analysis Workshop</i> <b>NMISA</b>
14h00	Sean Strydom <i>How much can an assessor do at an accreditation assessment....459</i> <b>SANRAL</b> T107	Ian Veldman <i>Evaluation and Comparison of Two Air Bearing Linear Translation Stages....550</i> <b>NMISA</b> T207	Joline Lubbe <i>Secondary standard instrumentation used at the NMISA for activity measurement....590</i> <b>NMISA</b> T307	
14h30	Johan Kock <i>An introduction to the SAPS Forensics Laboratory....469</i> <b>SAPS Forensics Laboratory</b> T108			
15h30	<b>Tea/Coffee – Exhibition Viewing</b>			
Session Chairman				
Venue Room				
16h00	André de Villiers <i>The role of chemical analysis in wine production and research....482</i> <b>University of Stellenbosch</b> T109			
17h00	<b>Pre-dinner drinks/Wine tasting</b>			
	<b>Banquet</b> (Dress code: Jacket and Tie)			



**Day Three Wednesday 14<sup>th</sup> October 2015**

07h45	<b>Registration and Coffee</b>	
Session Chairman		
Venue Room		
08h30	Facilitator: Maré Linsky <i>Workshop: Uncertainty of Measurement (Analytical)....644</i> <b>NMISA</b> <b>W101</b>	<i>Workshop: Uncertainty of Measurement (Physical)....N/A</i> <b>W201</b>
10h30	<b>Tea/Coffee and Manned Poster Session</b>	
Session Chairman		
Venue Room		
11h00	Facilitator: Maré Linsky <i>Workshop: Uncertainty of Measurement (Analytical)....644</i> <b>NMISA</b> <b>W101</b>	<i>Workshop: Uncertainty of Measurement (Physical)....N/A</i> <b>W201</b>

13h00		
14h00	<p>Steve Sidney <i>Feedback on the NLA proficiency testing schemes....N/A</i> <b>NLA</b></p> <p style="text-align: right;"><b>W102</b></p>	<p>Faith Hungwe <i>Tutorial: Calibration of Micrometers anvils using Optical flats and parallels...N/A</i> <b>NMISA</b></p> <p style="text-align: right;"><b>W202</b></p>
15h30	<b>CONFERENCE CLOSING</b>	

### Additional Papers

Jayne de Vos  
*The New NMISA: The Measure for Quality of Life....398*  
**NMISA**

Carel Morren  
*Upcoming Food Related Regulations and Impact on Analyses....611*  
**Department of Health**

Albert Smith  
*South African Food and Feed Safety Regulations: Where DAFF and DoH Differ....618*  
**Department of Agriculture, Forestry and Fisheries**

Sarah Ravhudzulo  
*ISO 17025 and SANAS Guidelines for Use of Reference Materials and PT Scheme Participation....625*  
**SANAS**

M. Fernandes-Whaley  
*African Food and Feed Reference Material Programme....634*  
**NMISA**

M. Fernandes-Whaley  
*Food and Feed Reference Material and PT Scheme Needs – Knowledge Café....642*  
**NMISA**

W. P. Nxumalo, Y. Naude, M. Fernandes-Whaley  
*Combining Ultrasonic Extraction (USE) and Solid Phase Extraction (SPE) for the Analysis of 11 Mycotoxins in Maize by Isotope Dilution Liquid Chromatography Tandem Mass Spectrometry (SID-UHPLC-MS/MS)....710*  
**NMISA**

M. M. A. Motaung  
*The Value of Adhering to Turnaround Times in the Bacteriology and Zoonotic Diseases Laboratories at Onderstepoort. An Assessment Over 2 Years....719*  
**Agricultural Research Council-Onderstepoort Veterinary Institute**