

# PROGRAM: 10<sup>th</sup> ALC WORKSHOP 2017

---

## Wednesday, 29 November

---

|               |   |
|---------------|---|
| 10:00 – 17:00 | Arrival   |
| 18:30 – 19:30 | Opening (Wallenberg Research Centre)  |
|               | Opening address: Prof L Warnich, Dean: Faculty of Science, Univ Stellenbosch  |
|               | Invited Lecture: <b>Einstein's impact after 100 years of general relativity theory.</b><br>– Prof Joseph Indekeu, Dept. Physics and Astronomy, Univ Leuven, Belgium |
| 19:30 – 21:30 | Dinner (Wallenberg Research Centre)   |

---

## Thursday, 30 November

---

|               |  |
|---------------|--|
| 07:30 – 08:30 | Breakfast (Wallenberg Research Centre) |
|---------------|--|

### Session 1 *Chair: Erich Rohwer*

---

|               |  |  | Abstract |
|---------------|--|--|----------|
| 08:30 – 09:00 | Registration   |  |          |
| 09:00 – 09:30 | Opening Proceedings<br>Dean Faculty of Science (Conference Venue)    |  |          |
| 09:30 – 10:20 | Exploring the plant endomembrane system with laser-based microscopy. | <u>C. Hawes</u> ,<br>V. Kriechbaumer,<br>A. Osterrieder and<br>S. Botchway | INV 01   |
| 10:20 – 10:40 | Tea  |  |          |

### Session 2 *Chair: Christine Steenkamp*

---

|               |  |  | Abstract |
|---------------|--|--|----------|
| 10:40 – 11:00 | Synthesis and characterisation of $\text{La}^2\text{O}_3:\text{Bi}$ phosphor.      | <u>B. M. Jaffar</u> , H. C. Swart, H. A. A. Seed Ahmed and R. E. Kroon             | T1       |
| 11:00 – 11:20 | Surface analysis and cathodoluminescence degradation of ZnO powder and thin films. | <u>E. Hasabeldaim</u> , O. M. Ntwaeaborwa, R. E. Kroon, E. Coetsee and H. C. Swart | T2       |
| 11:20 – 11:40 | Luminescence properties of Bi doped strontium oxide powder.                        | <u>M. M. A. Hassan</u> , R. E. Kroon, A. Yousif and H. C. Swart                    | T3       |
| 11:40 – 12:00 | Comparison of Ce and Bi co-doping on the luminescence of Tb doped $\text{YPO}_4$ . | <u>M. M. Ishag Beriama</u> , H. C. Swart, H. A. A. Seed Ahmed and R. E. Kroon      | T4       |

|               |  |  |    |
|---------------|--|--|----|
| 12:00 – 12:20 | Influence of post-annealing atmosphere on the optical properties and energy transfer between Pr <sup>3+</sup> and Dy <sup>3+</sup> in mixed lanthanum-yttrium oxyorthosilicates.           | <u>S N. Ogugua</u> , H C. Swart and O M. Ntwaeaborwa | T5 |
| 12:20 – 12:40 | The influence of oxygen pressure on the structural and luminescence properties of pulsed laser deposited (Y,Gd) <sub>3</sub> Al <sub>5</sub> O <sub>12</sub> :Ce <sup>3+</sup> thin films. | <u>Korir P.C.</u> , Dejene F. B                      | T6 |
| 12:50 – 14:00 | Lunch (Conference venue)   |  |    |

**Session 3**      **Chair: Heidi Abrahamse**

**Abstract**

|               |  |   |     |
|---------------|--|---|-----|
| 14:00 – 14:20 | Synergistic effect of Doxorubicin in combination with Phthalocyanine photosensitizer on MCF-7 breast cancer cells.                   | <u>E.C. Aniogo</u> , B.P. George and H. Abrahamse   | T7  |
| 14:20 – 14:40 | Effect of photobiomodulation at 660 nm on the JAK/STAT signaling pathway in normal wounded and diabetic wounded fibroblast cells.    | <u>S.W. Jere</u> , H. Abrahamse, N.N. Houreld.      | T8  |
| 14:40 – 15:00 | Effectiveness of Photodynamic Therapy using Zinc Pthalocyanine in the eradication of Cervical Cancer and Cervical Cancer Stem Cells. | <u>E P Chizenga</u> , N Hodgkinson, H Abrahamse     | T9  |
| 15:00 – 15:20 | Establishment of an in vivo melanoma model to monitor the activity of a targeted SNAP-tag PDT fusion protein.                        | <u>F A Nsole Biteghe</u> , E Padayachee and S Barth | T10 |
| 15:20 – 15:50 | Tea  |   |     |

**Session 4**      **Chair: Giovanni Hearne**

**Abstract**

|               |  |   |     |
|---------------|--|---|-----|
| 15:50 – 16:10 | Resolution-enhanced imaging using quantum correlations.                                      | <u>Ermes Toninelli</u> , Miles J. Padgett and Others      | T11 |
| 16:10 – 16:30 | Elastic properties of the chalcogenide alloy Ge <sub>2</sub> Sb <sub>2</sub> Te <sub>5</sub> | D. Wamwangi, B. Mathe, <u>M. Baloi</u> , D.G. Billing, C. | T12 |

|               |  |  |     |
|---------------|--|--|-----|
|               | by surface Brillouin scattering.   | Persch, M. Salinga, M. Wuttig  |     |
| 16:30 – 16:50 | Free space transport of classical entanglement.                              | <u>E. Otte</u> , C. Rosales-Guzmán, B. Ndagano, C. Denz <sup>1</sup> , A. Forbes | T13 |
| 16:50 – 17:10 | Removal of PMMA within PS matrix by wet etching.                             | <u>A. Talla</u> , S. R. Dobson, Kh. Talla, Z. N. Urgessa and J. R. Botha         | T14 |
| 17:10 – 17:30 | Development of titanium oxide for photo-electrochemical hydrogen production. | <u>K. Talla</u> , C. Mbulang, A. Talla, Z. N. Urgessa and J. R. Botha            | T15 |
| 17:30 – 19:00 | Wine Tasting presented by Stellenrust  |  |     |
| 19:30 – 21:00 | Dinner (Conference Venue)  |  |     |

---

***Friday, 1 Desember***

---

07:30 – 08:30 Breakfast (Conference Venue)

***Session 5 Chair: Ernest van Dyk***

---

|               |   |  | <b>Abstract</b> |
|---------------|---|--|-----------------|
| 09:00 – 09:50 | Vector light fields: generation, detection and applications.  | <u>Carmelo Rosales-Guzmán</u> and Andrew Forbes, Physics, WITS                             | INV 02          |
| 09:50 – 10:10 | Fluorescence microscopy used to observe the diffusion of single fluorescent probes embedded in thin polymer films, at different temperatures. | <u>C Sibanda</u> , G W Bosman, E G Rohwer  | T16             |
| 10:10 – 10:30 | Vibrational spectroscopy for characterization of biological materials.  | <u>C Pfukwa</u> , P Neethling, M Rautenbach, L Minnes, N T. Hunt, A W. Parker, E G. Rohwer | T17             |
| 10:30 – 10:50 | Tea   |  |                 |

***Session 6 Chair: Ted Kroon***

---

|               |   |   | <b>Abstract</b> |
|---------------|---|---|-----------------|
| 10:50 – 11:20 | Microscopic interface effects on Brillouin acoustic phonons of SrF <sub>2</sub> . | <u>H N. Dube</u> , B A. Mathe, D Wamwangi               | T18             |
| 11:20 – 11:40 | Mechanical and electronic properties of diamond-like                              | <u>W M. Mbiombi</u> , B. Mathe, D. Wamwangi, R. Erasmus | T19             |

|               |  |  |     |
|---------------|--|--|-----|
|               | carbon films by PVD.   | and D. G. Billing                                    |     |
| 11:40 – 12:00 | Developing the Laser Shock Peening Technology for Africa: a Multifaceted Initiative.                                 | <u>Prof Claudia Polese</u> , Daniel Glaser           | T20 |
| 12:00 – 12:20 | A Preliminary Numerical Assessment of Indentation Profile of Laser Shock Peening Process in Aluminium Alloy 2024-T3. | <u>M. Khodja</u> , D. Glaser, H. Fekirini, C. Polese | T21 |
| 12:20 – 12:40 | Residual Stress Measurement in Laser Shock Peened Aluminium Alloys.  | <u>S N. van Staden</u> , C Polese                    | T22 |
| 12:40 – 13:00 | Effectiveness of Laser Shock Peening in Post Processing Additive Manufactured Ti-6Al-4V.                             | <u>N. Ivanovic</u> , C. Polese, I. Yadroitsev        | T23 |
| 13:00 – 14:00 | Lunch (Conference venue)   |  |     |

**Session 7**      **Chair: Claudia Polese**

|               |   |   | <b>Abstract</b> |
|---------------|---|---|-----------------|
| 14:00 – 14:20 | Laser Cladding of ZrB <sub>2</sub> Reinforced Ti-SiC Cermet coatings on Ti6Al4V Substrate for Aero-engine Components. | <u>Farotade GA</u> , Popoola API and Pityana SL   | T24             |
| 14:20 – 14:40 | Laser Raman probing carbon nanotube interlinking after ion implantation and pressurization.                           | <u>L. Kapesi</u> , G. R. Hearne, J. Changundega and R. M. Erasmus   | T25             |
| 14:40 – 15:00 | Full-Duplex Bidirectional Data Transmission and Data Exchange Based on Twisted Lights Multiplexing in Fiber.          | <u>Jun Liu</u> , Shi Chen, Yifan Zhao, Long Zhu, Andong Wang, Shuhui Li, Jing Du, Cheng Du, Qi Mo and Jian Wang | T26             |
| 15:00 – 15:20 | Digital generation of multiple scalar and vector beams using a single hologram.                                       | C. Rosales-Guzman, <u>N.A. Bhebhe</u> and A. Forbes   | T27             |
| 15:20 – 15:40 | Tea   |   |                 |

**Session 8**      **Chair: Gurthwin Bosman**

|               |                            |                                   | <b>Abstract</b> |
|---------------|----------------------------|-----------------------------------|-----------------|
| 15:40 – 16:00 | Assessment of Photovoltaic | <u>I M Kwembur</u> , E E van Dyk, | T28             |

|               |   |   |     |
|---------------|---|---|-----|
|               | module degradation using Electroluminescence and other opto-electronic techniques.                      | J L Crozier, F J Vorster R M Dix-Peek, and M K Munji                  |     |
| 16:00 – 16:20 | Laser Based Surface Synthesis of Nickel alloy coating on Ti-6Al-4V for Marine Asset Integrity.          | <u>O S Adesina</u> ,<br>A P I Popoola, S L Pityana,<br>D T Oloruntoba | T29 |
| 16:20 – 16:40 | Claddings for power generation applications: Effects of laser cladding parameters on process maps.      | <u>S. T. Nyadongo</u> , E. O. Olakanmi & H. P. Burger                 | T30 |
| 16:40 – 17:00 | Effects of laser cladding operational parameters on processing maps of Co-based alloys.                 | <u>K. Malikongwa</u> , M. Tlotleng and E. O. Olakanmi                 | T31 |
| 17:00 – 17:20 | Ultrafast transient absorption spectroscopy of hematite nanoparticles for water splitting applications. | <u>A.T. Paradzah</u> , M. Diale and T.P.J. Krüger                     | T32 |
| 17:20 – 17:40 | Aerosol studies using LiDAR, CALIPSO and MERRA-2 data in South Africa.                                  | <u>Lerato Shikwambana</u> and Sivakumar Venkataraman                  | T33 |
| 17:40 – 18:00 | Laser-Aerosol Interaction in a LiDAR Experiment.  | <u>R. Guehaz</u> ,<br>S. Venkataraman,<br>M. Traïche                  | T34 |
| 18:15 – 19:00 | Demonstrations by the Stellenbosch Chapter of the OSA   |   |     |
| 19:30 – 21:30 | Dinner (Conference Venue)   |   |     |

---

***Saturday, 2 Desember***

---

07:30 – 08:30 Breakfast (Conference Venue)

***Session 9 Chair: Erich Rohwer***

---

|               |  |  | <b>Abstract</b> |
|---------------|--|--|-----------------|
| 08:30 – 09:10 | Surface segregation in a binary polymeric gel.                           | Dr Buddhapriya Chakrabarti                                 | ST 1            |
| 09:10 – 09:50 | The application of Mie scattering to study individual aerosol particles. | <u>A.D. Ward</u> , M.D. King, S.H. Jones and R.H. Shepherd | ST 2            |
| 09:50 – 10:30 | Ultrafast 2D-IR Spectroscopy – Method and Applications                   | N.T. Hunt  | ST 3            |
| 10:30 – 10:50 | Tea  |  |                 |

|               |  |  |      |
|---------------|--|--|------|
| 10:50 – 11:30 | Structured Illumination Microscopy (SIM) and Point Spread Function Engineering (PSF) for live-cell imaging super resolution microscopy | <u>R. Pal</u> , Frida H. Torkelsen and Edward N. Ward  | ST 4 |
| 11:30 – 12:10 | Seeing is believing: Illuminating light onto mTORC1 signalling inside the live cell using laser microscopy.                            | <u>A.R. Ahmed</u> , R.J. Owens, C.D. Stubbs, A.W. Parker, R. Hitchman, R.B. Yadav, C. Hawes, S.W. Botchway | ST 5 |
| 12:10 – 12:50 | Introduction to fibre optics.  | Alexander Heidt  | ST 6 |
| 12:50 -13:00  | Conclusion: Certificates and Awards  |  |      |
| 13:00 – 14:00 | Lunch (Conference venue)   |  |      |
| 14:00 – 22:00 | Excursion  |  |      |

---

***Sunday, 3 Desember***

---

|               |                        |
|---------------|------------------------|
| 07:00 – 08:00 | Breakfast (Apartments) |
| 08:30 – 12:00 | Departure for Airport  |