

2018
SOUTH AFRICAN NATIONAL ANTARCTIC PROGRAMME
(SANAP) 5th SYMPOSIUM



13 – 16 August 2018
Hermanus
South Africa

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2018 SANAP SYMPOSIUM PROGRAMME

MONDAY 13 AUGUST 2018

11:00 – 14:00 Arrival & Registration

13:00 – 14:00 Lunch

SESSION 1 - WELCOME & PROGRAMME OVERVIEW – Chairs: Ken Findlay and Michael Kosch

14:00 – 14:30 **Official Welcoming & Symposium Opening**

14:30 – 14:45 Opening Statements by National Research Foundation

14:45 – 15:00 Opening Statements by Department of Science and Technology

15:00 – 15:30 **Tea Break**

SESSION 2 - REPORT BACK SESSION – Chair: Ken Findlay

15:30 – 16:00 **Ian Meiklejohn** - Report back on the SCAR meeting

16:00 – 17:00 **Pedro Monteiro and Stephen Hosking** – Report back on the Polar Observatory Initiative.

SESSION 3 -THEME C2 - HUMAN ENTERPRISE: PALAEOSCIENCES AND HUMAN HISTORY (ORAL PRESENTATIONS) – Chair: Greg Hofmeyr

17:00 -17:15 **Isabelle Ansorge** - SEAmester continues to grow! CO1

17:15 -17:30 **Anché Louw** – A new SANAP portal C201

17:30 **Evening Function - Finger Supper**

19:00 **Public Lecture - “South Africa’s legacy in the Antarctic region”**

TUESDAY 14 AUGUST 2018

08:00 – 08:15 Housekeeping

SESSION 1 - THEME B1 - LIVING SYSTEMS: ECOSYSTEM FUNCTIONING AND THE RESPONSE TO GLOBAL CHANGE (ORAL PRESENTATIONS) – Chair: Kyle LLOYD

08:15 – 08:30 **Fannie W. Shabangu** - Songs of humpback whales (*Megaptera novaeangliae*) off Antarctica and South Africa B101

08:30 – 08:45 **Bradford S. Ripley** - Invasive sub-Antarctic grasses respond to increasing temperatures at the expense of chilling tolerance B102

08:45 – 09:00 **Susanne Fietz** - Shifts in phytoplankton and microbial community composition in function of trace metal cycling in the Southern Ocean B103

09:00 – 09:15 **Nico (P.J.N.) de Bruyn** - Marion Island Marine Mammals: individual variation and population processes B104

09:15 – 09:30 **Guy F. Midgley** - Novel insights into Marion Island plant function through sensing of the Photochemical Reflectance Index (PRI) B105

09:30 – 09:45 **Greg J.G. Hofmeyr** - Influence of ontogeny and sex on the trophic ecology of Southern Ocean fur seals: Information from dentine B107

09:45 – 10:00 **Pierre A. Pistorius** - Ocean utilization of marine top predators at Marion Island: Recent highlights and future perspectives B108

10:00 – 10:30 **Tea Break**

SESSION 2 - THEME B1 - LIVING SYSTEMS: ECOSYSTEM FUNCTIONING AND THE RESPONSE TO GLOBAL CHANGE (ORAL PRESENTATIONS) (CONTINUED) – Chair: Mia Wege

10:30 – 10:45 **Surendra Vikram** - Metagenomic derived insights of microbial communities in the Southern Indian Ocean B109

10:45 – 11:00 **Max Ortiz** - Food is in the air: Alternative pathways of primary production in Antarctic soils 1010

11:00 – 11:15 **Bettine Jansen van Vuuren** - Genetic information at different spatial scales B109

SESSION 3 – THEME B2 - BIODISCOVERY AND BIOTECHNOLOGY (ORAL PRESENTATIONS) – Chair: Mia Wege

11:15 – 11:30 **James R. Lloyd** - Mining the Southern Ocean microbiome B201

SESSION 4 - COMBINATION OF THEMES A & B - EARTH SYSTEMS AND/OR LIVING SYSTEMS (ORAL PRESENTATIONS) – Chair: Mia Wege

11:30 – 11:45 **Ian (K.I.) Meiklejohn** - Active layer and permafrost monitoring in Western Dronning Maud Land, Antarctica AB101

11:45 – 12:00 **Thomas J. Ryan-Keogh** - Southern Ocean estimates of phytoplankton primary production through coupled observations and experiments AB102

SESSION 6 - THEME B1 - LIVING SYSTEMS: ECOSYSTEM FUNCTIONING AND THE RESPONSE TO GLOBAL CHANGE (SPEED TALK PRESENTATIONS) (CONTINUED) – Chair: Thomas Ryan Keogh

- 12:00 – 12:05 **Sunet van Aswegen** - The microbial composition of algal mats in meltwater ponds in nunataks of the Western Dronning Maud Land B1S1
- 12:05 – 12:10 **Rito L. Mikhari** - Characterisation of hypolith communities in Dronning Maud Land, Antarctica B1S2
- 12:10 – 12:15 **Mthokozisi Twala** - An aggressive invasive, *Sagina procumbens*, causes a partial invasional-meltdown on sub-Antarctic Marion Island B1S3
- 12:15 – 12:20 **Rabia Mathakutha** - Differences in trait variation between native and invasive plant species, an implication for climate change B1S4
- 12:20 – 12:25 **Christien Steyn** - Risk assessment of alien plants in the southern ocean - using distribution modelling approaches to predict potential future invaders B1S5
- 12:25 – 12:30 **Robert D. Pienaar**- Characterising soil microbiomes associated with cushion plant species *Azorella selago* and *Sagina procumbens* on Marion Island B1S6
- 12:30 – 13:30 **Lunch**

SESSION 6 - THEME B1 - LIVING SYSTEMS: ECOSYSTEM FUNCTIONING AND THE RESPONSE TO GLOBAL CHANGE (SPEED TALK PRESENTATIONS) (CONTINUED) – Chair: Anne Treasure

- 13:30 -13:35 **Morgan J. Raath** - Do positive interactions expand the upper distributional limits of vascular plant species on Marion Island? B1S7
- 13:35 – 13:40 **Charné A. Gouws** - Do cushion plants act as nurse plants due to wind-driven seed trapping? B1S8
- 13:40 – 13:45 **Stephni van der Merwe** - Do plant-plant interactions affect functional traits? B1S9
- 13:45 – 13:50 **Nothando F.P. Mhlongo** - The influence of biotic interactions and abiotic factors on fine-scale variation in plant species richness and performance on sub-Antarctic Marion Island B1S10
- 13:50 – 13:55 **Florian Orgeret** - A winter foraging hotspot for king penguins from the Prince Edward Islands and the Crozet Archipelago B1S11
- 13:55 – 14:00 **Luca Stirnimann** - Plankton production and trophic dynamics in the waters surrounding the Subantarctic Prince Edward Islands archipelago B1S12
- 14:00 – 14:05 **Ian J. Weir** - Southern Ocean phytoplankton silica uptake: implications for leakage and carbon export B1S13
- 14:05 – 14:10 **Johan J. Viljoen** - Southern-Atlantic phytoplankton community composition, distribution and response to relief of light and iron limitation B1S14
- 14:10 – 14:15 **Marius W. Rossouw** - Insights into tundra fern physiology from close-distance remote sensing and leaf level gas exchange B1S15
- 14:15 – 14:20 **Peter C. le Roux** - Variation in the outcome of plant-plant interactions is not related to abiotic gradients across fine scales in four different taxa B1S16



- 14:20 – 14:25 **Michelle Greve** - Invasions in the changing sub-Antarctic: a project overview B1S17
- 14:25 – 14:30 **Eleonora Puccinelli** - Biological characteristics of the drifting bivalve *Gaimardia trapesina* in the Southern Ocean B1S18
- 14:30 – 14:35 **Charles von der Meden** - Habitat and pressures mapping at the Prince Edward Islands: Towards South Africa's National Biodiversity Assessment 2018 B1S19
- 14:35 – 14:40 **John H. Chau** - Spatial population structure of selected species on Southern Ocean Islands B1S20
- 14:40 – 14:45 **Daniela M. Monsanto** - Genetic patterns at fine spatial scales - complex findings in a complex landscape B1S21
- 14:45 – 14:50 **Harini Jagatap** - Comparing genetic patterns in species *Tullbergia bisetosa* (indigenous) and *Isotomurus maculatus* (invasive) on sub-Antarctic Marion Island B1S22
- 14:50 – 14:55 **Mario Mairal** - The origin of recent biological invasions in sub-Antarctic islands: the case of *Poa annua* B1S23
- 14:55 – 15:00 **Mia Wege** - Ontogeny of foraging site fidelity in two sympatric marine predators: a mother and pup perspective B1S24
- 15:00 – 15:30 **Tea Break**

SESSION 7 - THEME B1 - LIVING SYSTEMS: ECOSYSTEM FUNCTIONING AND THE RESPONSE TO GLOBAL CHANGE (SPEED TALK PRESENTATIONS) (CONTINUED) – Chair: Eleonora Puccinelli

- 15:30 – 15:35 **Chris (W.C.) Oosthuizen** - Making use of multiple surveys: estimating breeding probability using a multi-event-robust design capture-recapture model B1S25
- 15:35 – 15:40 **Kyle J. Lloyd** - The life history of male southern elephant seals: trade-offs at the population and individual level B1S26
- 15:40 – 15:45 **Tshepiso L. Majelantle** - Environmental drivers of at-sea foraging behaviour in southern elephant seals B1S27
- 15:45 – 15:50 **Itai Mukutyu** - Stable isotope ecology of two sympatric fur seal species from Marion Island, Southern Indian Ocean B1S28
- 15:50 – 15:55 **Kim L. Stevens** - The year-round distribution and foraging behaviour of grey-headed albatross at Sub-Antarctic Marion Island B1S30
- 15:55 – 16:00 **Ben Dilley** - The finches of Nightingale Island, Tristan da Cunha archipelago B1S31
- 16:00 – 16:05 **Marthan Bester** - Ross Seals: Pack Ice and Open Ocean Commuters B1S32
- 16:05 – 16:10 **Matthew Clayton** - Using metagenome based genome reconstruction to understand bacterial and archaeal assemblages in the Southern Ocean B1S33

**SESSION 7 - THEME B2 - LIVING SYSTEMS: BIODISCOVERY AND BIOTECHNOLOGY (SPEED TALKS) –
Chair: Fannie Shabangu**

- 16:10 – 16:15 **Nico Lübcker** - Keratinous tissue as matrix for obtaining time-based biochemical data
B2S1
- 16:15 – 16:20 **Ralph E.T. Vanstreels** - Molecular characterization of the worm *Diomedonema diomedae*
from the air sacs of grey-headed albatrosses on Marion Island
B2S2
- 16:20 – 16:25 **Sudharshan Sekar** - Metagenomic Analysis of the Soil Microbial Community in Marion
Island, South Africa
B2S3

**SESSION 8 - THEME AB - COMBINATION: EARTH SYSTEMS AND/OR LIVING SYSTEMS (SPEED TALKS)
– Chair: Nico Lübcker**

- 16:25 – 16:30 **Sibusiso S. Sinuka** - Temperature dynamics in mire ecosystems on Marion Island
B1S1
- 16:30 – 16:35 **Christel D. Hansen** - Comparing the frost environment of three disparate locations:
Western Dronning Maud Land of Antarctica, sub-Antarctic Marion Island and the High Drakensberg of South
Africa
AB1S2
- 16:35 – 16:40 **Elizabeth M. Rudolph** - Rock hardness as a relative-age indicator of glacially striated
surfaces on Marion Island
AB1S3
- 16:40 – 16:45 **Asmita Singh** - Understanding Southern Ocean-specific phytoplankton ecophysiological
response to iron availability
AB1S4
- 16:45 – 16:50 **Anne M. Treasure** - Marine mammals exploring the oceans pole to pole: a review of the
MEOP Consortium
AB1S5
- 16:50 – 16:55 **Peter G. Ryan** - Plastics in Antarctica – preliminary findings from the Antarctic
Circumnavigation Expedition (ACE)
A2S13
- 16:55 – 17:25 Theme B1 & B2 - Discussion & Conclusions

EVENING SESSION WORKSHOPS

1. APECS-SA (Venue - Hermanus Auditorium)
2. THE PLANNED SCALE SEASONAL CYCLE EXPERIMENT 2019 (Venue – SANSA)

Times to be determined by Workshop co-ordinators.

WEDNESDAY 15 AUGUST 2018

08:00 – 08:15 Housekeeping

SESSION 1 - THEME A1 - EARTH SYSTEMS: A WINDOW INTO GEOSPACE - (ORAL PRESENTATIONS) – Chair: Tshimangadzo M. Matamba

08:15 – 08:30	Judy A.E. Stephenson - Investigation of Pc5 pulsations during a TRINNI event	A101
08:30 – 08:45	Michael J. Kosch - Radar observations of the thermosphere	A102
08:45 – 09:00	Reolf D. Strauss - Status and future of the SANA neutron monitor	A103
09:00 – 09:15	Joe Kinrade - Tracking the evolution of rotating plasma features in Saturn's magnetosphere using auroral imagery from Cassini	A104
09:15 – 09:30	Rendani Ndanganeni - Analysis of the space weather events of 6-10 September 2017 and its impact on aviation	A105

SESSION 2 - THEME A1 - EARTH SYSTEMS: A WINDOW INTO GEOSPACE – (SPEED TALK PRESENTATIONS) – Chair: Michael Kosch

09:30 – 09:35	Amoré Nel - Novel radar and optical observations of black auroras in the upper atmosphere	A1S1
09:35 – 09:40	Lerato Shikwambana - Space borne and ground based lidar	A1S2
09:40 – 09:45	Golekamang Thaganyana - Investigate ionizing radiation in the troposphere using ground-based Neutron Monitor, ACE satellite and RBSP satellite data for aviation radiation forecasting	A1S3
09:45 – 09:50	Ntlakanipho Ngwane - Mesoscale neutral wind variability near auroral arcs measured using Fabry-Perot Interferometers	A1S4
09:50 – 09:55	Stanislaus Nnadih - Sprites observations in South Africa, the journey so far	A1S5
09:55 – 10:00	Dakalo C. Mashao - Sprite over South Africa	A1S6
10:00 – 10:30	Tea Break	

SESSION 3 - THEME A1 - EARTH SYSTEMS: A WINDOW INTO GEOSPACE – (SPEED TALK PRESENTATIONS) - (CONTINUED) – Chair: Lerato Shikwambana

10:30 – 10:35	Moshe G. Mosotho - Dosimetry at commercial airline altitudes	A1S7
10:35 – 10:40	Tshimangadzo M. Matamba - The Ionospheric response to CME and CIR-driven storms	A1S8
10:40 – 10:45	Jean C. Uwamahoro - Highlights about the performances of different storm-time TEC modelling techniques	A1S9
10:45 – 10:50	Tsige Atilaw - Investigation of TIDs using SANA Super DARN radar	A1S10
10:50 – 11:05	Geoffrey H. Grantham - Progress in the Gondwana Amalgamation and Correlation Project	A1O6

11:05 – 11:35 Theme A1 - Discussion & Conclusions

SESSION 4 - THEME A4 - EARTH SYSTEMS: CARBON-CLIMATE LINKS AND GEOTRACES (ORAL PRESENTATION) – Chair: Susanne Fietz and Ryan Cloete

11:40 – 11:55 **Alakendra N. Roychoudhury** - GEOTRACES Program in South Africa, latest developments, achievements and future plans A4O1

SESSION 5 - THEME A4 - EARTH SYSTEMS: CARBON-CLIMATE LINKS AND GEOTRACES (SPEED TALK PRESENTATIONS) – Chair: Susanne Fietz

11:55 – 12:00 **Ismael (K.) Kangueehi** - Southern African aerosol trace metal concentration and dissolution kinetics characteristics A4S1

12:00 – 12:05 **Sandi M. Smart** - **Ground**-truthing the Foraminifera-bound Nitrogen Isotope Paleo-proxy in the Modern Southern Ocean A4S2

12:05 – 12:10 **Ryan Cloete** - Seasonal comparisons between dissolved trace metals (Copper, Zinc and Nickel) in the Southern Ocean. Insights into deep winter mixing A4S3

12:10 – 12:15 **Kolisa Y. Sinyanya** - Microbe-nutrient interactions in the Agulhas System Climate Array marine system A4S4

12:15 – 12:20 **Mhlangabezi Mduetyana** - The kinetics and implications of nitrification in the Southern Ocean mixed layer A4S5

12:20 – 12:25 **Natasha van Horsten** - A winter GEOTRACES study characterizing Fe-binding ligands and the physical speciation of Fe in the Southern Indian Ocean A4S6

12:25 – 13:00 Theme A3 & A4 - Discussion & Conclusions

13:00 – 14:00 **Lunch**

SESSION 6 - THEME D1 - INNOVATION, TECHNOLOGY AND ENGINEERING (ORAL PRESENTATIONS) – Chair: Stefan Schoombie

14:00 – 14:15 **Janine Schoombie** - Utilising computational simulations and data measurements to quantify and assess the ecological impacts of wind flow across Marion Island D1O1

14:15 – 14:30 **Anriëtte Bekker** - SAA II – Big brother & her digital twin D1O2

14:30 – 14:45 **Johnathan Ward** - Engineering for Space Science D1O4

SESSION 6 - THEME D1 - INNOVATION, TECHNOLOGY AND ENGINEERING (SPEED TALK PRESENTATIONS) – Chair: Anriëtte Bekker

14:45 – 14:50 **Christopher P. Gray** - HF Antenna Array Characterisation Using a Multi-Copter Platform D1S1

14:50 – 14:55 **Brendon M. Nickerson** - Full scale shaft-line responses in open water and ice D1S2

14:55 – 15:00 **Jandre Mouton** - Open water resistance of the SAA II D1S3

15:00 – 15:05	Christof M. van Zijl - Human responses to vibration on a vessel during a storm in the marginal ice zone	D1S4
15:05 – 15:10	Gerhard (P.G.) Durandt - Towards integrated engineering data platform for vessel monitoring	D1S5
15:10 – 15:15	Martinique E.C. Engelbrecht - Measurement and analysis of sleep disturbance aboard the SA Agulhas II	D1S6
15:15 – 15:20	Andrei Sandru - Intelligent determination of the ice concentration and floe size	D1S7
15:20 – 15:25	Kyle A. Goddard - Simulating wind patterns across Marion Island using computational fluid dynamics	D1S8
15:25 – 15:30	Stefan Schoombie - Fine-scale flight: Using high frequency data loggers to study the at-sea behaviour of wandering albatrosses	D1S9
15:30 – 16:00	Tea Break	
16:00 – 16:30	Theme C & D Discussion & Conclusions	

PARALLEL OPTIONAL TOUR OF SANSA FACILITIES IN HERMANUS

18:00	EVENING BRAAI FUNCTION AT SANSA FACILITIES IN HERMANUS
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THURSDAY - 16 AUGUST 2018

SESSION 1 – THEME A2 - EARTH SYSTEMS: SOUTHERN OCEAN IN THE COUPLED OCEAN (ORAL PRESENTATIONS) – Chair: Luke Gregor

- 08:00 – 08:15 **Thato N. Mtshali** - Seasonal depletion of the sub-surface iron reservoir in the sub-Antarctic zone of the Southern Ocean A201
- 08:15 – 08:30 **Werner Nel** - Landscape and climate interaction on Marion Island A202
- 08:30 – 08:45 **Marcello Vichi** - Surfing white waves: impacts of a severe storm on the winter marginal ice zone in the Southern Ocean A203
- 08:45 – 09:00 **Sarah E. Fawcett** - Using the nitrogen isotopes to understand the past and present polar ocean and atmosphere: a plan for research capacity development and student training A204
- 09:00 – 09:15 **Sarah-A. Nicholson** - Storm driven mixing in the Sub-Antarctic Zone and implications for phytoplankton biomass and CO2 fluxes A205
- 09:15 – 09:30 **Pedro M.S. Monteiro** - Where is the Southern Ocean Carbon Cycle going in the 21st Century? 7 years of learning from SOCCO and international research A206
- 09:30 – 09:45 **Sandy J. Thomalla** - What We Have Learned From SOSCEX: A High-Resolution Glider Experiment in the Sub-Antarctic Southern Ocean A207
- 09:45 – 10:00 **Keith R. MacHutchon** - The temperature, bulk salinity and brine characteristics of pancake ice at two single locations on the outer and inner edges of the marginal ice zone in the Atlantic-Indian Ocean sector of the Antarctic Ocean A208
- 10:00 – 10:30 **Tea Break**

SESSION 2 - THEME A2 - EARTH SYSTEMS: SOUTHERN OCEAN IN THE COUPLED OCEAN (SPEED TALK PRESENTATIONS) – Chair: Thato Mtshali

- 10:30 – 10:35 **Mark C. Hague** - Marginal Ice Zone Phytoplankton Phenology in CMIP5 Models A2S1
- 10:35 – 10:40 **Ehlke de Jong** - Assessment of the synoptic variability of the Antarctic marginal ice zone with in situ observations A2S2
- 10:40 – 10:45 **Emma L. Bone** - A novel approach to investigating fluorescence quantum yield variability in the Southern Ocean A2S3
- 10:45 – 10:50 **Ayanda Mpalweni** - Characterising the seasonal response of the mixed-layer and the transitional-layer to the passage of storms in the Sub-Antarctic Zone A2S4
- 10:50 – 10:55 **Shantelle Smith** - Steady-state box modelling of ammonia/um across the air-sea interface during winter in the Atlantic sector of the Southern Ocean A2S5
- 10:55 – 11:00 **Mishka Rawatlal** - Observing the seasonal cycle of pCO2 in the SAZ using pHA2S6
- 11:00 – 11:05 **Luke Gregor** - Interannual drivers of the seasonal cycle of CO2 in the Southern Ocean A2S7

- 11:05 – 11:10 **Makabongwe Siggala** - Decadal shifts in the diet of four penguin species at Marion Island
A2S8
- 11:10 – 11:15 **Lillina Ruiters** - King penguins at Marion Island: inter-annual spatial variability in foraging
and trophic ecology
A2S9
- 11:15 – 11:20 **Heather J. Forrer** - Phytoplankton group-specific contributions to the Subantarctic
biological pump
A2S10
- 11:20 – 11:25 **Zandria Jordaan** - CO₂ as a driving factor of Carbon isotopic signature in the Southern
Ocean
A2S11
- 11:25 – 11:30 **David W. Hedding** - Aeolian processes and landforms on sub-Antarctic Marion Island
A2S12
- 11:35 – 11:40 **Nicolette Chang** - Towards an improved Southern Ocean in the Earth System Model, CSIR
VR-ESM
A2S14
- 11:40 – 11:45 **Andrea Cook** - An investigation into the porosity of sea ice from the Atlantic-Indian
marginal ice zones and its link to temperature and salinity using imaging analysis
A2S15
- 11:45 – 11:50 **Marcel D. du Plessis** - Submesoscale instabilities drive enhanced variability of the
Southern Ocean mixed layer: a four-year Seaglider experiment
A2S16
- 11:50 – 11:55 **Precious Mongwe** - Mechanisms of the Sea-Air CO₂ Flux Seasonal Cycle biases in CMIP5
Earth Systems Models in the Southern Ocean
AS217
- 11:55 – 12:20 Theme A2 - Discussion & Conclusions
- 12:30 – **Lunch**

