



The CATSA Bulletin – 2018

The official newsletter of the Catalysis Society of South Africa

149-462 NPO

Legend Golf & Safari Resort, South Africa, November 2018

Issue IV

Welcome to CATSA 2018

On behalf of the organising committee, I would like to welcome all delegates to CATSA 2018. This year, we are expecting approximately 185 delegates, somewhat less than previous CATSA conferences. However, the broader catalysis community in South Africa is represented.

The diverse needs of the catalysis community are catered for in this year's scientific program. Besides the presentations of established researchers, the program also contains several student presentations. I urge all of you to attend as many presentations as possible and to support the student presentations as well as the poster session which will feature many of our young researchers. They are the future of CATSA.

Each year one highly reputable international researcher receives the Catalysis Society's Eminent Visitor's Award. This year it goes to Prof. Gregory Jerkiewicz from Queen's University, Canada. We are privileged to be able to host him and we look forward to his plenary lecture at the conference. Prof. Jerkiewicz already started his lecture tour around the country by visiting WITS, UJ and NWU. After the conference he will be visiting UCT. I hope that these visits will lead to long-lasting and fruitful interactions with the catalysis community in South Africa.

This year we are also privileged to award the Lifetime Achievement Award to Mr. Philip Gibson from SASOL. This award is given to a researcher that made significant contributions to the field of catalysis in South Africa. We are also looking forward to his plenary lecture at the conference.

However, this conference would not be possible without the financial support from our sponsors. Their support is highly appreciated.

Finally, I would like to wish all of you a pleasant conference and I hope that you enjoy both the scientific program as well as the social program that we've put together. I also encourage you to enjoy all the amenities at Legend Golf & Safari Resort. If there's anything the organising committee can do to make your CATSA 2018 experience a pleasant one, then please do not hesitate to approach me or any other member of the organising committee.

Cornie van Sittert - Conference Chair CATSA 2018



Prof Cornie van Sittert (NWU), the Chairperson of CATSA 2018.



Prof Gregory Jerkiewicz (Queen's University, Canada) the Eminent visitor at CATSA 2018.



Mr Philip Gibson receiver of the Lifetime Achievement Award at CATSA 2018.

From the Chairman of CATSA

Dear delegate of the 29th annual national conference of The Catalysis Society of South Africa. By virtue of your attendance of this year's conference, you are a member of the Society for the forthcoming year. CATSA, the non-profit organisation representing catalysis interests in the country, and by extension its members, remains a vibrant and growing body, and has taken some meaningful forward strides during 2018

The legal and fiscal requirements of our income tax- and VAT-registered NPO status remain an ongoing focus for CATSA, especially as we come to terms with the additional obligations. In this regard I would like to take the opportunity to thank our Treasurer, Jack V. Fletcher, for his tireless efforts in managing all financial compliance obligations. Furthermore, over the past two years, we have formalised our membership database and certification process, and continue to make adjustments to optimise this endeavour.

in total four students presented at conferences in Europe (United Kingdom and Italy), and a further 2 students were supported to attend the EFCATS Summer School in the Czech Republic. Reports on their experiences can be found in this newsletter.

A notable achievement for the year is the revival of the drafting of a 'Roadmap for Catalysis in South Africa'. Although the merits of such a plan for catalysis have been recognised for many years, the Society was previously unable to identify an individual to spearhead the initiative. Sincere and heartfelt thanks is extended to Sasol, and Philip Gibson in particular, for offering to act a coordinator of the now re-invigorated roadmap drafting process, which is believed to make significant headway in 2019.

I would also like to take this opportunity to formally welcome Prof Gregory Jerkiewicz as this year's CATSA Eminent Visitor. Through this award we are able to attract leading scientists to undertake a focussed visit to the catalysis community of South Africa in the interest of promoting international scientific exchange in the field of catalysis. This initiative continues to bear much fruit in the form of cemented relationships, research collaboration and student exchange.

Lastly, I would like to extend my great appreciation to a dedicated and hardworking CATSA Committee, who have selflessly contributed to the smooth operation and governance of the Society, especially as we grapple with the changing

Continues on page 2

The CATSA Committee 2018

During the Annual General Meeting of the Society, held during the 2017 annual conference, new members to the 2018 CATSA Committee were elected for a two year term. The new committee is as follows:

Chairperson | Stephen Roberts (UCT)
Secretary/Treasurer | Jack V Fletcher (UCT) co-opt
2018 Conference Chairperson | Cornie van Sittert (NWU)
Media Officer | Cornie van Sittert (NWU)
Student Representative | Huguette Kishinkwa (NWU) co-opted
Nico Fischer (UCT)
Selwyn Mapolie (US)
Dean Brady (WITS)
Holger Friedrich (UKZN)
Francois du Toit (Clariant) co-opted
Gregory Govender (SASOL) co-opted
Linda Jewell (UNISA)
John Moma (WITS)
Andrew Swarts (NWU)
Banothile Makhubela (UJ)
Marilé Landman (UP)

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organisational dynamics. In particular, I would like to thank Associate Professor Nico Fischer, the former Chairperson of the Society, on behalf of all members of CATSA for his exceptional leadership during 2016 and 2017.

In closing I wish you all a great 2018 conference and surely speak for all of us when I extend my gratitude to this year's organising committee, especially Prof Cornie van Sittert. I trust we will all have a memorable and constructive time together.

Stephen Roberts – Chairperson CATSA

CATSA 2017

The 28th CATSA conference took place at Kwa-Maritane Bush Lodge, Pilanesberg, North-West Province, on the 19-22 November 2017. It was jointly organized by the Universities of Limpopo (UL) and South Africa (UNISA), with a significant administrative support generously supplied by Poretech. The composition of the Organising Committee stood as follows:

UL: Profs MP Mokhonoana & HR Chauke; **UNISA:** Profs L Jewell & MS Scurrall;

Poretech: Ms M Pretorius & Mr C Noakes

Both national and international (*overseas*) keynote speakers graced the occasion. As per the long-standing tradition of CATSA conferences, an Eminent Visitor formed the core of the organizing process. The 2017 Eminent Visitor was Prof KP de Jong of the Utrecht University in the Netherlands, who gave a well-attended *Plenary Lecture* on the morning of Monday, the 20th November 2018. He honoured all his scheduled institutional tours at key institutions. His most popular institutional talk was titled "**Frontiers of Energy**", and was presented at Sasol, WITS as well as UCT, while the one titled "**Fundamental Studies on the Synthesis of Supported Metal Catalysts**" was given at UKZN. At the conference, what distinguished Prof de Jong as Eminent Visitor was his extensive interaction with postgraduate students both formally and informally for the duration of the conference. *This didn't go unnoticed, and "Thank You" Prof de Jong!* A picture of him receiving his Eminent Award from the then CATSA Chairman, Prof N. Fischer, is included as a memento in this report. A series of keynote lectures were also lined up to add vigour to the technical program, and were given by catalysis experts that included Eric van Steen, Roger A. Sheldon, Zhengfang Chen, Jeffrey Kevin and G. A. Kolb. The technical program was heavily populated with student presentations, both for Orals and Posters (*held at the Bakubung Camp, where some of the delegates were accommodated*). This seemed good news as it guarantees continuity of the society in the future as the current membership is aging.

Social events included morning Game Drives (*Mon-Wed*), Braai (*Mon*), Poretech Challenge (*Mon*), CATSA Banquet (*Tue*), and many more.

On behalf of the Organising Committee of CATSA2017, I would like to take this opportunity to thank the delegates and all those who chaired respective technical sessions. Most importantly, I would like to thank all the sponsors who generously enabled this conference to be a success. Without them, this conference would not happen. **A very big "THANK YOU" Sponsors!** I would also like the Society (CATSA) for identifying us as organisers of the 2017 conference.

Peter Mokhonoana - Conference Chair CATSA 2017



*Prof. Dr. Patricia J. Kooyman
(University of Cape Town)
Chairperson of the 2019
CATSA conference*

Outlook CATSA 2019

On behalf of the Catalysis Institute, Department of Chemical Engineering, University of Cape Town, we invite you to attend the 30th annual meeting of The Catalysis Society of South Africa, CATSA 2019. "*From Nanomaterial to Industrial Process*" will be held at the Club Mykonos Resort, located on the serene shores of the scenic Langebaan Lagoon, Western Cape from the 10th to 13th November. The venue is located approximately 130 km from Cape Town. Prof. Angelos Efstathiou will be the CATSA Eminent Visitor for 2019.

Patricia Kooyman - Conference Chair CATSA 2019



*Prof KP de Jong receiving
Eminent Award from Prof N
Fischer*



*Kereshen Naicker from UKZN
received the Clariant best
student oral award at
CATSA2017*



*Huguette Kishinkwa from
NWU received the Micro-
metrics best student poster
award at CATSA2017*



*Prof. Angelos Efstathiou
(University of Cyprus) the
Eminent visitor at CATSA
2019.*

Student travel grants 2018

The Catalysis Society of South Africa offers every year a number of travel grants to students based at a South African institution to support attendance of local or international conferences. The grants are awarded based on a competitive application reviewed by the Committee (for more information see <http://www.catsa.org.za/awards/student-travel-awards>). In 2018 six grants were awarded, to Shanna Swart (PhD, UCT), Revana Chanerika (PhD, UKZN), Laura Leckie (PhD, US), Ené Storm (PhD, US) and Adrian Fortuin (PhD, UCT). As part of the award the students are requested to share their experience and gathered insights at the attended event with the Society.

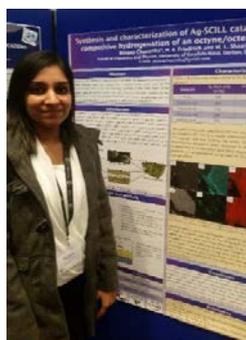
Shanna Swart, a PhD student in the Centre for Bioprocess Engineering Research (CeBER) at the University of Cape Town received the CATSA Student Travel Grant for attendance at an

International Catalysis Conference. Shanna presented a poster entitled 'Cell-free bioconversion of *n*-octane to *n*-octanol via a
Continues on page 3

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heterogeneous and bio-catalytic approach' at the 19th Catalysis & Chemistry Conference (NCCC XIX)

held from the 5th – 7th of March 2018 in Noordwijkerhout, The Netherlands. The Conference featured 6 plenary lectures, 8 keynote lectures, over 90 oral presentations and 150 poster presentations. One of the highlights of the conference was an outstanding lecture by the 2016 Nobel Prize Winner in Chemistry, Professor Ben Feringa who gave a talk on 'Exploring catalytic space with metal-based systems'. This talk gave valuable insight into the use of organometallic reagents for enantioselective allylation, sustainable low-E-factor transformations and adaptive catalysts. The four parallel sessions covered a board range of catalysis topics including: Renewables, Co-ordination chemistry, Homogeneous, Heterogenous, Bio-catalysis and many more. The multi-topic lectures at the NCCC and cross-discipline nature provided an ideal forum for students, industry personnel and academics to network, engage and breakdown the barriers that exist between the various aspects of catalysis. This was further complimented by the Career Development & Opportunities (CDO) session which provided an opportunity for PhD students and PostDocs to gain more insight into their career opportunities and for companies to present themselves as potential employers.



Revana Chanerika

The Faraday discussion on Designing Nanoparticles for Catalysis took place from the 16-18 May at the Royal Society of Chemistry in Burlington House, London, this year. The conference was a follow up from the very successful 2016 Faraday Discussion where various questions on nano-materials were raised and thus led to a specific topic of discussion for 2018. The core aim of the 2018 Faraday discussion was to develop a thorough understanding of nanoparticle synthesis and characterisation from current methodology as well as to develop a theory that would drive a new route for preparation and characterisation.

I was lucky enough to have been among over 100 delegates, many of which were leading scientists from all over the world. The discussion featured an introductory lecture by Bruce Gates (University of California, Davis, USA) among 4 parallel sessions discussing various topics on the theory behind nanoparticles in reactions, the challenges faced in characterising nanoparticles, control of nanoparticulate synthesis and the application of new nano-catalyst structures.

I gained a great deal of knowledge from this discussion, and it being my first Faraday conference, I realised the level of thought that needed to go into catalyst design - acidic and basic environments, introduction of reducing agents, manipulation of current methodology in designing nanoparticles as well as the topic of chemically engineering reactors for the design of nanoparticles. One of my main highlights of the conference was a topic presented as a poster on SILP catalysis, very similar to my current project (SCILL catalysis), where new ideas and possibilities in my current methods of nanoparticle preparation were exchanged with the presenter. From this experience, I look forward to attending the next Faraday discussion to be held in London in the year 2020.

I (Laura Leckie, PhD Student, Stellenbosch University) was awarded with a CATSA international travel grant to attend the 28th International Conference on Organometallic Chemistry (ICOMC 2018). The conference was held in Florence, Italy during the hot summer days of 15th to 20th July. There were a variety of



Laura Leckie

parallel sessions covering all aspects of organometallic chemistry, of which a large part related to catalysis research. On the 19th July I was given the opportunity to give an oral presentation titled: 'Novel metal-loaded crosslinked benzoxazine polymers as catalytic materials in organic transformations' in the 'Polymerisations, Materials and Nanomaterials' session. This proved to be a great opportunity to share my research with an international audience. Overall, the conference was very well organized and I would highly recommend attendance of the ICOMC conference for CATSA members in future.

This year I (Ené Storm) had the amazing opportunity to attend the 28th International Conference on Organometallic Chemistry (ICOMC 2018) held in Florence, Italy. The conference took place from 15 to 20 July and included lectures and flash presentations spanning over 6 parallel sessions as well as 2 poster sessions. I was fortunate enough to be able to present a portion of my PhD research in both a flash presentation and a poster entitled "Alcohol oxidation by Au & Pd nanoparticles supported on triazine-based organic & hybrid support materials". The conference included lectures by internationally recognized scientist such as Matthias Beller, John F. Hartwig, Armando Pombeiro and Nobel laureate Ben Feringa to name just a few. This experience has provided me the opportunity to interact with international researchers regarding my PhD research and I have come home with several new ideas. I would like to thank CATSA for awarding me a student travel grant and making this opportunity possible.

I (Adrian Fortuin) gave an oral presentation at the 68th Annual Meeting of the International Electrochemistry Society in Providence, Rhode Island, USA. The presentation was well received by the audience and resulted in academic discussions with esteemed researchers within the field of electrocatalysis, in particular Prof Juan M. Feliu of the Universidad de Alicante was very interested in my work and we continued our discussions after my presentation.

Further to this, it was an honour to attend talks given by leaders in my field, viz. Richard McCreery (University of Alberta and National Institute for Nanotechnology), Marc Koper (Leiden University), and Hector Abruña (Cornell University). These talks were very informative and was a great medium to engage these researchers in discussing their work. I was able to apply their work to my own research and strengthen my understanding of the field.

Lastly, the social aspect of the meeting was a valuable experience, as I was able to liaise with PhD students, Post Doctoral Fellows and researchers in my field. These discussions allowed me to experience different problems from different laboratories, and led to new ideas and approaches to tackle my research work. This was a fantastic opportunity to network and gain insight into the research conducted around the world.

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I would like sincerely thank the Catalysis Society of South Africa committee for the financial support and I will be forever grateful for the experience. This has enabled me to take important steps towards advancing my own research career and expanding my knowledge base in the broad field of electrochemistry and electrocatalysis.



Project Background

Originally conceived as a science-mentoring program targeted at grade eleven learners and primary school learners, the Hawu! Science Outreach Initiative underwent a structural change this year. We were able to change the scope of the mentoring, and actually focussed the project by collaborating with the Umkhumbane School's Project. In addition, we established a reading club for primary school learners, and collaborated with Open Data Durban on a Citizen Science project.

1. The Hawu-USP Eskom Expo collaboration

The aim of the collaboration was to prepare grade 9 and 10 learners for the Eskom Expo, through structured weekend workshops that served as science based training for the learners.



Learners at the Eskom Expo.

The entire project ran for a total of eighteen weeks and involved learners from the five schools in the Umkhumbane Area, as well as students from UKZN Westville and Howard College campuses who volunteered as mentors.



Meet the team: Hawu! Mentors and the USP-Eskom Expo coordinator during the mentor-training workshop. The author is exactly in the middle.

Overall, the project was a success. We had a total of 12 learners participating on the Expo. The following list is a breakdown of the awards received by our learners:



Mentor (R) helps a learner with data processing, Wiggins Secondary School, Mayville (Cato Manor), Durban



Thobeka Ndlovu (second from the left) receives a gold medal for her project

- Top 7 Females – **Thobeka Ndlovu**
- Top 2 Outstanding Environmental Conservation Projects (Water) – **Pamela Mseleku**
- Top 2 Projects that offer Improvements to Human Health – **Lusanda Majola**
- Highly Commended – **Sbonelo Chonco, Mhlonishwa Shazi and Nonhle Mlanduli**
- Bronze Medals – **Zakithi Sishi, Pamela Mseleku and Sifiso Tuskushe**
- Silver Medals – **Nomonde Mdingi, Nomvuselelo Mthethwa, Lusanda Majola, Luthando Mngadi and Samkelisiwe Nyongwana**
- Gold Medal – **Thobeka Ndlovu**
- Best in Category – **Thobeka Ndlovu and Luthando Mngadi**
- Most Innovative Medical Research Project – **Lusanda Majola**
- Best Development Project – **Thobeka Ndlovu**

2. Masifunde Reading club

This year marked the beginning of a reading club targeted at grade 4 and 5 pupils, from a primary school based in Chesterville, a Township neighbouring Westville. We are presently facilitating a “write a book” workshop for the kids in the hopes of growing their interest in literacy.



Learners during a reading club session

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Mentor helps learners outline and plan their story during the "write a book" workshop, HP Ngwenya Primary School, Chesterville, Durban

3. Citizen science project

We have also collaborated with Open Data Durban in establishing data clubs composed of school learners. Open Data Durban set up weather monitoring stations at two schools, which continuously collect air quality data. The data club members collate, process and write up the data in the form of a blog post.



Citizen Science mentoring session at St Theresa's Primary School, Overport, Durban

Acknowledgements:

Rail Refurb for funding, UKZN School of Chemistry and Physics, Studienstiftung (Germany), the Umkhumbane School's Project, STEC@UKZN, and Open Data Durban

Sinqobile V.L. Mahlaba

Coordinator, Hawu! Science Outreach Initiative

Masifunde Reading club founder

Catalysis Research Group

UKZN

Previous recipients of the Lifetime Achievement Award



Michael Scurrrell (2011)



Neil Coville (2007)



Cyril O'Connor (2005)



Ray Everson (2002)



Jan du Plessis (1999)



Marc Dry (1998)



Wim Mandersloot (1998)

Sponsors of CATSA 2018



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Bronze Sponsors



Achievements by CATSA members

Mike Scurrrell has been selected as one of the 1000 experts by the Zhejiang Province in Eastern China, advising them on emission control catalysts and catalytic conversions options in bioalcohol production. He is also planning a collaboration with Joanneum Research in Austria in the use of plasma routes for synthesizing solid catalysts. He is working with the Nuclear Research Unit of Kyoto University in ^{127}Pt Mossbauer effect spectroscopy of gold materials, including gold catalysts. Advanced characterization collaboration using various types of XAS continue with the LNLS synchrotron in Sao Paulo, Brazil, as a means of furthering the understanding of a variety of nanomaterials, including photocatalysts.

Sudoku:

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<http://1sudoku.com>

n° 16540 - Level Easy

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<http://1sudoku.com>

n° 210093 - Level Medium

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<http://1sudoku.com>

n° 320533 - Level Hard

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<http://1sudoku.com>

n° 427476 - Level Expert

From the Editor

Dear member of the Catalysis Society of South Africa, without your contributions a newsletter is not possible. The purpose of the newsletter is to serve as a platform to report on new developments and past year's events. For this reason I would like to invite all Society members to send contributions to me in good time before the next CATSA conference.

Cornie van Sittert
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