Graduation Newsletter

2018

DEPARTMENT OF CHEMISTRY

RHODES UNIVERSITY *Where leaders learn*

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Where leaders learn

CONGRATULATORY MESSAGE FROM THE HOD

The Message from the HOD.

Recently I came across a graduation message that said: "***Don't have a life-long goal***", and I thought: "Wait a minute did I just get it wrong?" Surely we have all been told how good it is to have this one life-long goal? However, the idea behind this crazy message was not that you shouldn't have dreams at all, but that having one goal means you are blind to many, many other opportunities around you. So I agree - rather focus on the next micro-dream, do that for a while, do it passionately and well, but don't be so pin-point focused on the future that you fail to see someone right next to you who needs your input for something, or is offering you another opportunity to learn something.

> ***As Ken Robinson said: "For most of us the problem isn't that we aim too high and fail – it's just the opposite – we aim too low and succeed."***

I don't want to belittle your achievements in this Graduation for one minute – you've just become part of a very small number of South Africans (by South Africans I am using our Constitution's preamble that "***South Africa belongs to all who live in it***"), who successfully completed a degree. Just don't let that be your last aim.

I recently started reading another good book – I may not finish since my life goes something like this – Start reading a good book, find it asks an interesting question, research that question for a while, find someone recommends a good book, go back to Step 1. But this new book is based on some research on 73 students from South African Universities, and the stories are fascinating. One of the early lessons I've learned in reading is how valuable the university experience has been, even for students who did not complete their studies. Those students would be seen, and in fact are usually recorded as "failures", but the skills they learned, the people from all walks of life they met, the community partnerships they forged while at Rhodes has opened up employment, study opportunities, travel, and even some romantic partnerships.

Grab onto those networks and your next opportunity.

> ***"Education is the most powerful weapon which you can use to change the world" – Nelson Mandela***.

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OUTSTANDING REPUTATION FOR TEACHING AND RESEARCH

The Chemistry Department at Rhodes University has earned a reputation as a leader in academic excellence in both teaching and research. The scientific knowledge and enthusiasm of Rhodes chemistry research and teaching staff has quite clearly been passed on to students. The consistently excellent results from the department are proof that the teaching environment is both disciplined and stimulating.

The department celebrates an astounding total number of 106 publications in 2017, which was a combined effort between the Chemistry department and the Center of Nanotechnology Innovation (CNI). This achievement is a testament to the department's commitment to excellence in research.

2018 Masters and PhD Graduates

Congratulations *to the following students*

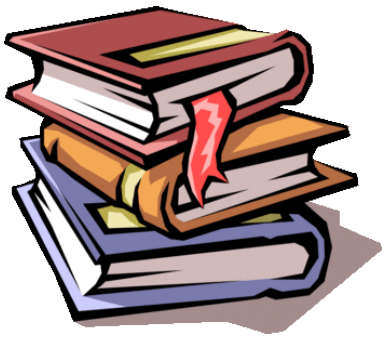
1. Ojodomo Achadu PhD S22 	**2. Siya Hulushe MSc F12** 
3. M Kota MSc F22 	**4. Mr Aviwe May S22** **MSc with distinction** 
5. Charles O'Donoghue **MSc with distinction S22** 	**6. Jessica Harris** **MSc with distinction S22** 
7. Ayowole Ayeni PhD F12 	**8. Bakary Diallo** **MSc with distinction S4** 
9. Linah Chisango MSc **G5/F22** 	**10. Zweli Hlatshwayo MSc S22** 

11. Augustus Oluwafemi PhD S3 	**Congratulations from the staff and students Department of Chemistry** 

Best Chemistry Students for 2017

First Year: Ms TE Mhungu

First Year: Ms C Odendaal



Second Year: Ms LT Matandirotya

Third Year: Ms BR Taylor

Honours: Mr UN Ndagano

The ANNUAL EASTERN PROVINCE SACI POST-GRADUATE CHEMISTRY SEMINAR took place at Rhodes University on Friday October 20th 2017. The four Universities in the region were represented well by their speakers, presenting on a range of research from natural product derived plasticizers to theoretical studies. It was exciting to see such a high calibre of young scientists enjoying the opportunity provided by SACI. The afternoon of talks was followed by the awarding of the SACI Post graduate award to Christian Nkanga (Rhodes University) and the James Moir medals for the region. The participants and supporters then enjoyed a short cocktail party which provided opportunity for networking and catching up amongst academics and students before the prizegiving and the long drive to the respective cities for Walter Sisulu University (both Mthatha and East London campuses were represented), University of Fort Hare and Nelson Mandela University.

JUNIOR SECTION (BSc Hons, B Tech, 1st year MSc)

The following students represented Rhodes University

Cuan Kruger (Rhodes): First Prize Exploring cocrystals

Akhona Ngqinambi (RU): Synthesis and characterization of fluorescence silica nanoparticles for biosensing applications

SENIOR SECTION (2nd year MSc, PhD)

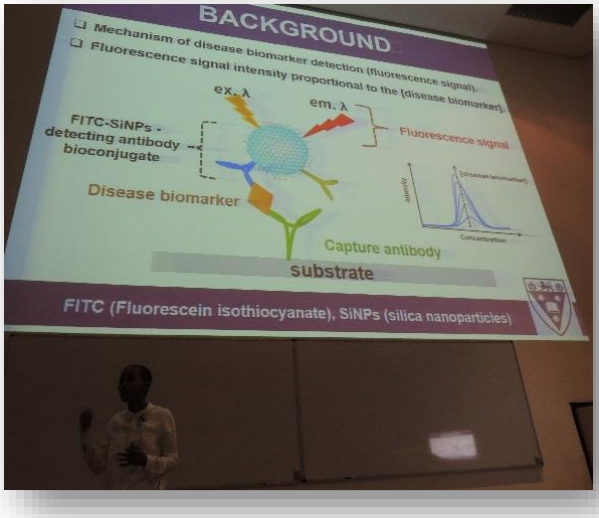
Sivuyisiwe Mapukata (RU): First Prize: Laser induced photodegradation of Orange G using phthalocyanine-cobalt ferrite conjugates in nanofibers

2017 SACI Postgraduate Awards

Christian Nkanga (Rhodes University)

Nthabeleng Molupe (Rhodes University)

Some memorable moments at the SACI Regional Seminars 201



Awards Received by Student

Congratulations to Christian, who bagged yet another huge accolade. He was selected as one of the Novartis Next Generation Scientists for 2018 and will spend an internship at their Research site in Basel in Switzerland later this year. Christian was selected from hundreds of applicants in ~140 countries to be one of 20 people on the programme for this year. Congrats also to the other students who made it to the final round of 50, but were not selected for the programme, we are very proud.

2017 Honours year in a nut shell

2017, has been by far, my most amazing and challenging academic year. It was an honour to be elected as the honours class rep. It was a life changing experience and I learned a lot about leadership. It such a privilege to have shared a class with such amazing classmates. All my classmates made easier for me to be the class rep because of the respect I got from each and every one. We all shared an amazing academic bond whereby we helped one another with difficult courses. With my few words I can simply say that the2017 honours class was phenomenal.

Welcome To Our Incoming Honours Students of 2018

We would like to welcome our Honours class of 2018.

This year is going to be tough… nothing worth fighting for is ever easy…So, I encourage you to stick to your academic plan and take pride in the classes you have chosen to complete your degree. If you have an academic-related problem, seek help from your supervisor, course coordinator or even just someone in the lab.

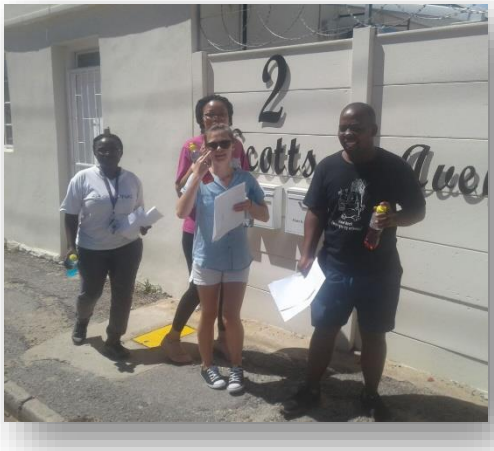
Your time here, and what you make of it, will serve you well during your lifetime, and ensure you will be able to look back and say to yourself, "My time here was not wasted!"

And finally, take opportunities that our multi-cultural campus provides. Please consider volunteering in Community Engagement Projects as the need is there for you.

With warm regards,
The Chemistry Department

The Amazing Race

On the 8th of February 2018, the Chemistry Department held a Team Building event. The event saw teams competing to win an Amazing Race. The whole department (honours, post graduates and staff) came together to make the day a success.



2017 Barker Lecture and Seminars

The 2017 Barker Lecture was given by Professor Susan Bourne. Professor Bourne is the Head of Department of Chemistry at the University of Cape Town.

"Supramolecular chemistry: useful properties through weak interactions" Tuesday, 25 July 2017.

In this lecture, she described work done her laboratory over the past decade or so, all of which relates to answering some of those "big" questions….To look at these interesting (and only sometimes useful) properties, we wander across the periodic table, at whim. Sometimes an organic compound is suitable for our purpose and sometimes we need something that contains a metal ion instead. Underpinning it all is an understanding of fundamental physical chemistry – how much energy, of what kind, how fast, how far will this reaction go? Examples included molecular sponges comprised of metal-organic frameworks which can 'breathe' as they release and resorb guest molecules, coordination frameworks which change colour on exposure to specific chemical species, and others which can exchange guest species in predictable ways.

She also presented 3 seminars with the title:

1. "Guest Exchange and Guest influence in Dynamic Frameworks" on Monday, 24 July 2017

2. "Chromophoric Framework Solids for Sensing and Storage" on Wednesday, 26 July

3. "SUPRAMOLECULAR GELS" on Thursday, 27 July 2017

Industry Day 2017

The Chemistry Departments Industry Day was one to remember with companies such as Woodoc, Merck, Tag Solvents, and Lasec. People such as Dr Emslie and Sue Robertson (Deputy Director of RU HR).

Quite a bit of information was given and all of the advice was worth listening to. After the formal sessions, we then proceeded to have informal chats and a light braai/dinner. Students were able to have one-on-one interactions with our guests which everyone said was very fruitful.

The Industry Day will be divided in two groups

Career Development

- If you studied how does your degree help in the business
- What initiatives do you use to attract customers
- Did your background in science help you to gain the trust of customers
- What skills do you need to build a successful business
- How important is a good team in the business
- What career paths do you see in your line of business for graduates

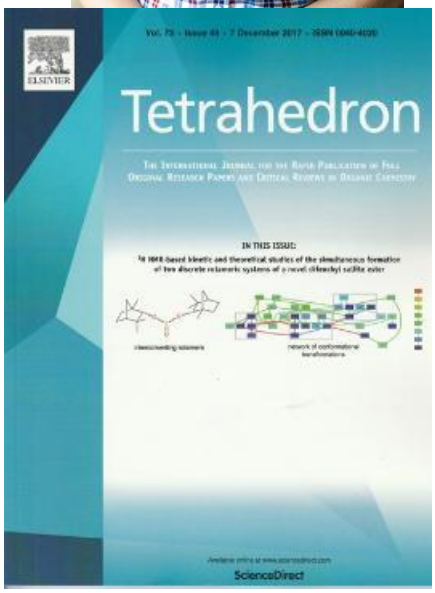
Launching your career do's and don't

- How you started your business or your career
- Have you encountered any obstacles
- How important is collaboration and networking
- Mistakes and mishaps in the interview

The aim of the day was to guide our third years in how industry works and/or how a business works. We believe that some of our students do not know what opportunities their degrees hold as well as what other work they can do, whether it be by placing orders or working in admin etc. so broadening them to think wider is good.

Staff News

Dr Kevin Lobb spent the six months sabbatical catching up on unfinished projects and also attending courses for his PGDHE (including the Catalyst, and Evaluation of Teaching and Learning Courses). A paper is almost ready for submission to J. Chem. Ed for this work. He attended the GCC 2017 conference in Mainz, Germany, where he presented some of the mechanistic work that was completed in the latter half of the year.



During Alicia Singh's honours year, following a literature method to synthesize fenchene most certainly did not produce fenchene, but rather two different products which were formed reproducibly under a wide variety of conditions. During part of her PhD (supervised by Dr. Lobb and Prof. Kaye) , these products were determined to be two rotamers of a difenchyl sulfite ester. She explored this reaction with detailed experimental work including NMR-based kinetics analysis and temperature work. The experimental results were coupled with computational work at both semi-empirical and DFT levels. After acceptance by the journal Tetrahedron, the graphical abstract was chosen to be on the front cover of the 7th December 2017 issue.

Teaching Award 2017

Mrs Joyce Sewry has been awarded The VC's Distinguished Senior Teaching Award. She is one of three Chemistry Staff members to have been nominated and awarded this prestigious accolade. Professor Kaye was awarded in the year 1994 and Professor Davies-Coleman in the year 2005. This just shows the undying commitment of the department to their students.

Mrs Sewry has always been passionate about her teaching and, most importantly, the development of young people. She believes that our society and country needs scientifically literate individuals who can contribute to its success and development. Her motivation shines through the support tutorials she hosts, her chemistry 1R lectures and her service learning.

A desire of hers is to create awareness to students about chemistry not being only about theory but about how science is involved in everyday life.

One challenge Mrs Sewry has taken upon herself is to change and mold the attitudes of students and young people towards chemistry and science as a whole.

We are so proud of you and wish you nothing but the best. Well done and keep the flame of chemistry alive.

Black Science, Technology & Engineering Professionals (BSTEP)

Written by Ms Gail Cobus

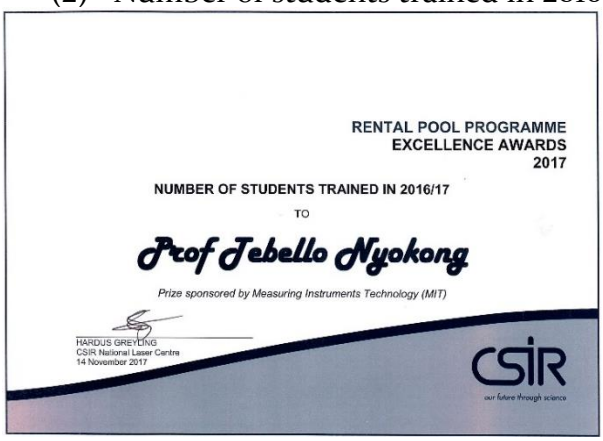
On the 30th November Black Science, Technology & Engineering Professionals (BSTEP) identified Prof Nyokong as a legend and honoured her in its first ever Black Science, Engineering and Technology (SET) excellence award ceremony. The award ceremony took place at the CSIR International Convention Centre, but Prof Nyokong was unfortunately not available to accept the award herself. Two of her former PhD students (Dr Nolwazi Nombona and Dr Vongani Chauke) however received the award on her behalf.

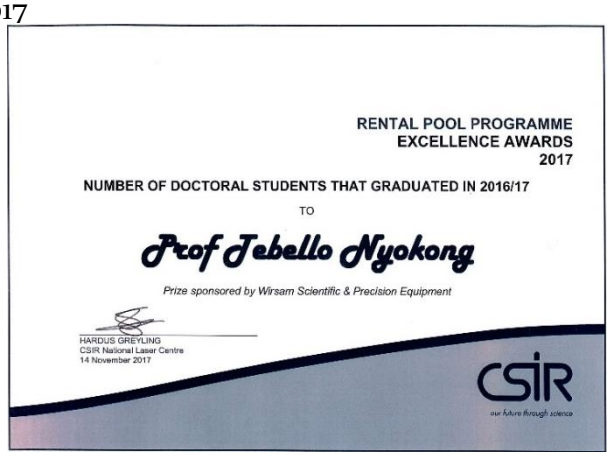
BSTEP is a non-profit organisation that has been at the forefront of advancing black SET excellence since 2005. It is a (SET) advocacy organization that seeks to promote the attainment of a critical mass of SET skills locally, regionally and internationally.

Student Graduations

At an award ceremony held in Johannesburg on the 14th November, 2017, the Council for Scientific and Industrial Research (CSIR) – National Laser Centre Rental Pool Programme presented the following awards to Prof Nyokong based on student training on lasers supplied through the programme:

(1) An award for Number of Doctoral students that graduated in 2016/2017 and
(2) Number of students trained in 2016/2017





Staff Development

Written by Mr Monde Mafani

I would like to thank Rhodes University for their academic development support as I am very much passionate about health and safety at the work place. Through ADHOC funding from Mr Schalk van der Merwe, big support from Miss Nikki Kohly (Safety officer) and the Chemistry department, I have managed to achieve SAMTRAC (safety management course), ISO 9001(Quality management), 14001(Environmental management) and 18001(Occupational health and Safety management) within two years of working for Rhodes University that afforded me the chance to reach one of my dreams in life of getting qualifications on health and safety, thus making me more qualified as a safety officer.

Post Docs

Dr Richard Mbi Beteck

I am Richard Mbi Beteck, from the English-speaking part of Cameroon. I conducted my tertiary education in Cameroon (BSc, Biochemistry), Finland (MSc, Medicinal Chemistry), and South Africa (Ph.D, Pharmaceutical chemistry). I am currently a post-doctoral research fellow in Dr David S. Khanye's drug discovery research group. My research interest includes structural design, synthesis and biological evaluation of small organic molecules as potential drug substrates for tropical infectious diseases (TB, malaria, trichomoniasis, sleeping sickness).

Dr Faez Khan

Dr. Faez Iqbal Khan received his PhD degree in Computational Chemistry in collaboration with department of Biotechnology and Food Technology from Durban University of Technology, South Africa in 2015. He got his B.Sc. and M.Sc. degrees in Biomedical Science and Bioinformatics. He was a postdoctoral researcher at Henan University of Technology, and a visiting scholar at South China University of Technology from November 2015 to February 2017. Dr. Khan joined Rhodes University, Department of Chemistry as a postdoctoral researcher in 2017 under the supervision of Dr. Kevin Lobb.

New Equipment: Bruker Compact Liquid Chromatography Mass Spectrometry (LC-MS/MS)

By Dr Xavier Siwe Noundou

In June 2017, Rhodes University purchased a last generation of Quadrupole Time-of-Flight (Q-TOF) Mass Spectrometry system (Bruker Compact) through an NRF Grant Infrastructure Funding Instruments (NEP), secured by Prof Rui Krause. This tandem (MS-MS) mass spectrometer can be used for structural and sequencing studies as well as qualitative and quantitative applications. The LC-MS/MS spectrometer is coupled to a UHPLC system (PDA detector) but also can operate via direct injection using a syringe pump to measure accurate molecular weight up to 3000 m/z. The system comes with electrospray ionisation (ESI), atmospheric pressure chemical ionization (APCI), atmospheric pressure photoionization detectors as well as a cryospray for temperature-sensitive samples. Some applications of this instrument include: determination of the purity of samples, sample confirmation, chemical modification, analysis of proteins, peptides, oligonucleotides, drug discovery, combinatorial chemistry, drug testing, water quality,

food contamination, enzyme reaction, protein digestion, amino acids sequencing etc. One of the particularities of this instrument is that the first analyser is used to select a molecular ion (precursor or parent ion). This chosen precursor then pass through the collision cell and is bombarded by gas molecules which fragment the precursor to form daughter ions (fragment ions) which are separated in the second analyser according to their mass to charge ratios. All the daughter ions are formed directly from the chosen precursor, and hence produce a fingerprint profile specific to the sample under investigation. These experiments provide important structural information for small organic molecules.

I would say that at Rhodes University, we are privileged enough to have this State-of-the-Art LC-MS/MS system and this would certainly improve learning at Rhodes University and speed up number of research projects, therefore increase the outputs for researchers working with the techniques associated to the instrument.

ALUMNI NEWS

Dr Sarah D'Souza to attend Nobel Laureate Meeting in Lindau

Author: Institutional Advancement- Nicklaus Kruger

Skill and hard work have driven Dr Sarah D'Souza, postdoctoral researcher in the University of the Western Cape's Department of Chemistry, to succeed - but it's also her passion for the science of nanomaterials that will take her to the 67th Nobel Meeting in Lindau, Germany, from 25 to 30 June 2017. Where she will have the chance to share ideas and inspiration with over 400 of the world's brightest young researchers, and dozens of Nobel Prize-winning scientists.

Dr Nolwazi Nombona to attend Lindau Nobel Laureate Meeting

Source: *Alumni Relations*

UKZN lecturer in the School of Chemistry and Physics, Dr Nolwazi Nombona, will attend the 67th Lindau Nobel Laureate Meeting in Germany in June.

Nombona, selected for the trip by the African Academy of Science (AAS), joins fellow UKZN representative Dr Mark Williams-Wynn, who is being sent by the Academy of Science of South Africa (ASSAf).

The annual Lindau meeting - this year dedicated to the field of chemistry - is a forum where about 30 Nobel Laureates meet the next generation of leading scientists, comprising close to 500 undergraduates, PhD candidates and post-doctoral researchers from all over the world. The meetings foster interaction among scientists of different generations, cultures, and disciplines.

Congratulations to Dr Prudence Ogunlade Executive Manager (TRANSNET)- AWARDED OLD RHODIAN AWARD FOR 2017.

The award "The University honours Old Rhodians who through their individual actions and achievements have enhanced the reputation of the University. The Award is specifically intended to acknowledge Old Rhodians as role models and in essence is the greater family of Rhodes rewarding one of their own"

COMMUNITY ENGAGEMENT

Science Amazing Race

At the end of the 2017 school year, Hoërskool PJ Olivier arranged a "Science Amazing Race" for their top grade 7-11 learners. One of the stations was based in the Chemistry Department, where the learners were shown the decomposition of hydrogen peroxide ("elephant's toothpaste" experiment) and learnt about the properties of carbon dioxide and the effects of too much CO_2 in the atmosphere.

SciPharm Open Day

On Saturday the 5th of August, the Faculty of Science and Pharmacy hosted its joint annual Open Day. The event was attended by 300 Grade 9 learners from our local schools who attended over 20 activities offered by RU, Albany Museum, SAIAB and the Amakhala Foundation. It was wonderful to see staff and 36 undergraduate students running the activities and assisting as chaperones.

RU also hosted the annual Eskom Expo. A total of 177 learners submitted their projects for the competition that were judged by 97 volunteer's judges and 3 moderators from the faculties of Science and Pharmacy. In total, six gold, ten silver, thirty four bronze, and twenty nine merit awards were awarded.

A huge thank-you is extended to Kim and Joyce for the Open Day arrangements, and to Kevin Lobb and the Scifest team for the Expo arrangements.

RU Open Day

The university also hosted schools from the broader Eastern Cape on the 8th of September for a general Open Day.

The departments ran experiments showing global warming effects on the ocean pH; catalytic methanol reaction; and how to make ice cream using liquid nitrogen.

Scifest 2018: Department of Chemistry

During the Annual Science festival held at Rhodes University from the 7th of March to the 13th of March 2018, the Chemistry Department hosted Professor Dudley Shallcross and Mr Tim Harrison from the University of Bristol.

Three Seminars were held with the following titles:

Research Seminar 1:- The myriad impacts of public engagement; including smoothing the transition from secondary to tertiary education

Research Seminar 2:- Air pollution indoor and outdoor

Research Seminar 3/Public Talk:- The Biosphere is Cool

HOD MESSAGE *continued from page 2*

* Going to University: The Influence of Higher Education on the Lives of Young South Africans by Jennifer M. Case, Delia Marshall, Sioux McKenna, Disaapele Mogashana (AHED 2018)

The world needs you – I say this every year, but it really does. Chemistry is everywhere (OK, apart from those companies selling "Chemical Free Cleaning Products", so the solutions to the next problem, the national challenges, the global sustainable development goals, etc., all involve chemistry at some point.

Even if they don't, as a Chemistry graduate, its now your shared responsibility to make sure we are using chemistry in a responsible way.

We are marking the 100th anniversary of the end of World War 1 – a war that was termed "The Chemists War" for many reasons, including the fact that this was the war that saw the development and mass-scale use of chemical weapons like chorine and mustard gasses. This despite the fact that less than 7 years before the start of the war almost all countries had signed agreements prohibiting their use. We also mark 80 years from the start of the second world war (or at least hostilities that led to its start), where again chemical weapons were used that killed millions. Once again after that war signatories across the globe banned the use of chemical weapons, yet even today we face the use of nerve agents like Sarin, VX, and Novichok.

So congratulations to all our graduates, parents, families, friends. Those of you who are starting a new phase of your life as outside education as business owners, bosses, teachers, entrepreneurs, employees, parents…. go ahead and change the world, but keep learning.

Those who are continuing with education maybe in postgrad studies or further degrees…., go ahead and change the university, but keep learning.And for everyone, as Charles M. Schultz put it – "Try not to have a good time… this is supposed to be educational".

Thank you for taking the time to read our Newsletter.