



## *SAIT Newsletter*

### **SAIT Training**

The first **Lubrication Engineering Course** (76) of 2012 was held during February at Science Park in Kelvin, Johannesburg.



#### **Delegates at Lubrication Engineering 76.**

Twenty-four delegates attended the course, which everyone passed. Ten delegates earned distinctions: Brian Ballinger, Troy Ganten-Bein, Albert Jackson, Devlin Moodley, Reinier Nel, Ratanang Nuku, Mark Parkin, Hendrik Schroeder, Aveshan Venketsamy, Bryan Winn and. Well done everyone!

**Lubrication Engineering 77**, scheduled to take place in Durban in May has been postponed to later in the month and will take place from 21 – 25 May. Registration forms are available from [secretary@sait.org.za](mailto:secretary@sait.org.za) or [admin@sait.org.za](mailto:admin@sait.org.za).

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### **SAIT 2012 Annual Dinner and Awards Ceremony, 2012**

This function will take place on Friday, 4 May 2012 at 19:00 for 19:30 at The Wanderers.

***Nominations for the Best Student Award are called for from our Universities.***

***Nominations for the Best Technical Achievement are called for from members and Industry.***

For further information, please contact Gill Fuller or Isabel Bradley at 011 802-5145/6 or e-mail [secretary@sait.org.za](mailto:secretary@sait.org.za) or [admin@sait.org.za](mailto:admin@sait.org.za).

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### **SAIT AGM and Afternoon Seminar on Materials**

On **Tuesday 29 May 2012**, the SAIT will present an afternoon Seminar on Materials. This will be followed at 18:00 by the SAIT's Annual General Meeting.

The Seminar will be titled ***"Energy Reduction through Materials Selection"***.

For details and a call for papers, please contact Gill Fuller or Isabel Bradley at 011 802-5145/6 or e-mail [secretary@sait.org.za](mailto:secretary@sait.org.za) or [admin@sait.org.za](mailto:admin@sait.org.za).

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### **Poster Day at Wits**

The annual Poster Presentation Day was held at the School of Chemical & Metallurgical Engineering at the University of the Witwatersrand on 10 November 2011. Fourth Year and Postgraduate Students participated.

The best Tribology-related poster was awarded by the South African Institute of Tribology to Ms. Dineo Lioma for her poster, Friction and Sliding Wear of High Purity Alumina Ceramics.



**Dineo Lioma with SAIT's Patrick Swan and Wits Lecturer, Natasha Sacks.**

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The **SAIMechE** offers training courses in many fields of Mechanical Engineering. Their website is [www.saimeche.org.za](http://www.saimeche.org.za).

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## Smoothing the Way With Lubrication

*By Isabel Bradley  
SAIT Assistant Secretary*

Lubrication is crucial to the smooth running of everything from the human body to space flight to human relationships.



### Lubrication of the Eyes is Currently High on Pharmaceutical Companies' Advertising Agenda

To lubricate is 'to make smooth or slippery', 'to reduce friction', or 'to smooth over'. Lubricants should be able to absorb and transfer heat, create a smooth interface over which another can run easily, and prevent oxidation and other forms of corrosion.

Human beings apply creams and lotions to their skin so that they feel smooth to the touch and appear attractive. Lanolin, taken from the wool of sheep, is often an ingredient in products designed to smooth the skin. Lipstick and lip balms help lips to glide over each other; castor oil when applied internally in small doses, lubricates the digestive system, making life more comfortable.



### Lanolin is Derived from Sheep's Wool

When it comes to medical products, whether for lubrication between the body and machines such as ultra-sound scanners, the moving parts of the machinery itself, parts of the body such as the eyes or the mucous membranes, or artificial joints, lubrication is essential. In an on-line article on the subject, Nye Lubricants state:

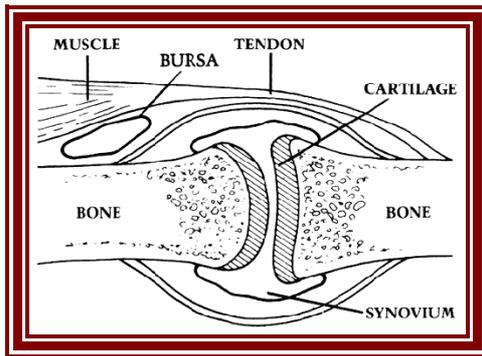
*When '...carefully selected, lubricants do much more than reduce friction and wear. They can lengthen the life of the device, broaden the temperature range at which it operates, reduce unwanted noise, control free motion, impart a clinically appropriate feel, provide an environmental seal, cut design and production costs — and even reduce warranty claims.'*

*(To read the full article, go to <http://www.nyelubricants.com/markets/medical.shtml>)*

Professor Klein and his colleagues at the Physical and Theoretical Chemistry Laboratory at Oxford reported the following discoveries in the 9 November issue of the journal, *Nature*: *'Boundary lubrication is common in machines but is also thought to act between joints and other living organs in the form of phospholipid films. This new mechanism could lead to better lubricated artificial implants, as well as to more effective treatments for joint problems like osteoarthritis.'*

*(To read more on this subject, go to <http://www.physorg.com/news82223568.html> )*

Naturally-occurring synovial fluid ensures easy movement of human joints. Medical science is still searching for a synthetic replacement.



**Joint Tissues**

Lubricants come in many forms. There are solids, such as soap and wax; **dry** lubricants such as graphite, molybdenum disulfide and tungsten; semi-solids – greases; liquids – oil in all its forms and from many sources; and gases such as air, oxygen and many others. Bearings are another form of reducing friction, allowing easy movement of machine parts; bearings themselves need to be appropriately lubricated to function properly.



**Ball Bearings**

In the kitchen there are many choices of lubricants, for use in frying, baking and roasting. Each selection is made not only for its taste and health attributes, but to ensure that the food does not stick to the pan, that it is easy to swallow, to smear on bread, or melt into hot toast, to prevent food burning, or to create a flame without burning for dramatic effect.



**Olive Oil**

Many oils used in or as food can cause blockage of veins and arteries by forming globules of cholesterol, leading to heart attacks or strokes. However, Omega oils such as those obtained from fish, prevent the build-up of cholesterol, and keep the blood flowing smoothly.

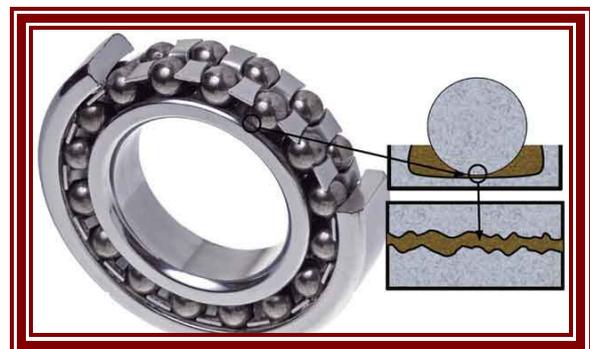
In any field, correct lubrication can prevent costly break-downs, while over- or under-lubrication can cause failures.



**Results of Excessive Lubrication**

When the Ancient Egyptians built the pyramids, they moved huge blocks of stone by pouring water between the stone and the ground –the first recorded example of a hydraulic system.

An in-depth study of lubrication covers a multitude of subjects, including understanding the mechanisms of friction; Rheology – the science dealing with the flow characteristics of materials; the properties, composition and application of all forms of lubricants. Among other things, the student will learn about flash points, foaming, corrosion-prevention, detergents, demulsifiers and emulsifiers, friction modifiers and antisquawk agents. For every type of mechanism one can imagine, there is a specific lubricant that will help it perform optimally, different from any other. Synthetic lubricants are a whole subject on their own, as are additives, hydraulics and bearings.



**Elastohydrodynamic Lubrication**

The subject is vast, and continually growing. Most financial managers and accountants who work

with budgets have little knowledge of the importance of lubrication and its impact on the running costs of their businesses, from fleet maintenance to the smooth running of a vast range of machinery. Education in all fields of lubrication and its optimal application throughout industry is of huge benefit to society, impacting of all spheres from running costs to health and personal safety.



As for inter-personal relationships, the lubricants of empathy, kindness, consideration of others, tact and carefully chosen words go a long way to creating happy working and home environments.



**Launch of the Space Shuttle, Discovery**

In fact, as Gill Fuller, secretary of the South African Institute of Tribology, mentioned recently: "From aromatherapy to the space shuttle, the world runs better on lubrication!"

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## Tribology in Action

As any graffiti-removal specialist will tell you, sand-blasting is definitely an effective method of removing substances that have bonded onto hard surfaces. Unfortunately, sand or other abrasive particles suspended in air or liquid also have a way of eroding not just spray paint, but pretty much anything they encounter. As a result, items such as helicopter rotor blades, airplane propellers, rocket motor nozzles and pipes regularly wear out and need to be replaced. Interestingly enough, however, scorpions live their entire lives subjected to blowing sand, yet *they* never appear to ... well, to erode. A group of

scientists recently set out to discover their secret, so it could be applied to man-made materials.



Read the full article: [Wear-resistant surfaces inspired by scorpions](#)

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## International Tribology-Related Events, 2012

**UNITI Mineral Oil Technology congress 20 & 21 March 2012:** Registration opened in October 2011. An early bird booking discount will be granted for registrations made before 15 December 2011. For further information go to the homepage at <http://www.umtf.de/> or contact Carmen Fogel at [Fogel@uniti.de](mailto:Fogel@uniti.de).

Keep your business moving ahead and be part of **ENEREXPO Vietnam 2012**. This valuable exhibition will be happening in **Hanoi, Vietnam from the 21st to the 23rd of March 2012**. Book your exhibition space today! Further information on ENEREXPO Vietnam 2012 is available on [www.enerexpovietnam.com](http://www.enerexpovietnam.com). To apply for a stand space at **ENEREXPO Vietnam 2012**, for information on affordable travel packages and for any other questions you might have, please contact Ms. Lisa Kuntze on: Tel: +27 (0)11 486 2775 or send an e-mail to: [lkuntze@germanchamber.co.za](mailto:lkuntze@germanchamber.co.za).

The Institution of Mechanical Engineers' **Tenth International Conference on Vibrations in Rotating Machinery (VIRM10)**, will take place from **11-13 September 2012** - for further information go to [www.imeche.org/events/c1326](http://www.imeche.org/events/c1326)

Each year the most influential players and decision makers of the International lubricants industry meet at the **International "LUBRICANTS RUSSIA" Conference** in Moscow. We invite you to join them at this event from **13 – 16 November 2012**, now in its 8th year. **To register please contact Elena Konstantinova, tel. +7 495 502-5433 or +7 495**

778-9332 e-mail: [Konstantinova.Elena@rpi-inc.com](mailto:Konstantinova.Elena@rpi-inc.com) or visit our website <http://www.rpi-conferences.com>

**21st International Baltic Conference  
Baltmattrib 2012** will be held in **Estonia, Tallinn,**  
from **October 18 to 19, 2012.**

Visit the official conference website  
[www.ttu.ee/baltmattrib2012](http://www.ttu.ee/baltmattrib2012) for further information.  
We are looking forward to seeing you in Tallinn.