



SAIT Technical Newsletter, March 2021

Bringing the Committee Closer to the Members and the Wider Tribological Community

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Tribology

Tribology in glacial terms, is revealing climate change on a disastrous scale. Eleven dead after an Indian glacier burst was highlighted in a BBC report from Uttarakhand in India.

- <https://www.bbc.com/news/world-asia-india-55975743>

The article begins: “Emergency workers are searching for as many as 150 people after a piece of a Himalayan glacier is believed to have fallen into a river, triggering a huge flood in northern India and killing 26.”



If you say that something moves or changes at a glacial pace, you are emphasizing that it moves or changes very slowly – but climate change is changing friction parameters and speeding up glacier movement. Glaciers move because of their immense weight, or the force of gravity. Movement occurs in different directions: down mountain valleys, across plains, or even out into the sea. The bottom of a glacier moves slower than the upper levels due to the **friction** created between the ice and the ground beneath it.

Reuters Photo at <https://www.bbc.com/news/world-asia-india-55975743>

Glaciers are comprised of snow accumulated over many years and compressed into large ice masses. Formed when snow remains in a location long enough to form ice, glaciers are unique in that they can move, flowing like extremely slow rivers due to their sheer mass.

The roughness of the ground's surface beneath the glacier, the temperature of the surfaces in contact with each other and the incidence of cavities filled with water all influence the level of friction and consequently the speed at which the glacier flows. As these changes occur under the massive size of the glacier, it is difficult to measure the exact parameters.



Picture from [MELTING GLACIERS: Glaciers, the great guardians of the stability of the planet's climate](#)

Measuring these parameters continues to gain in importance due to the relationship between the melting of glaciers and global warming. Global warming and the resulting glacier melt leads to a variety of issues including, but not limited to, a shortage of freshwater, excessive flooding, animal extinction, disappearance of coral reefs, reappearance of lethal diseases and disruption of weather patterns.

In the article "[A New Model of Ice Friction Helps Scientists Understand How Glaciers Flow](#)" published on December 18, 2018 by the American Institute of Physics, Professor Bo Persson of the Jülich Research Center in Germany, well-known in the field of tribology, describes a new model for examining ice friction.

Glaciers currently occupy approximately 10 percent of the world's land surface, mainly in the polar regions and contain approximately 75 percent of Earth's fresh water. Both percentages clearly indicate the importance of the relationship between human life and the health of the glaciers.

We do not have glaciers in Southern Africa, but global climate change is impacting us locally.

Please visit: <https://www.tribonet.org/modeling-ice-friction-in-glaciers/>



A Tribology Hero: Guillaume Amontons

The technology race and hastened obsolescence of both software and hardware tends to breed a disdainful attitude to the past. But it is in the past that great pioneers changed the course of thinking and we need to be reminded of this.

Guillaume Amontons (31 August 1663 – 11 October 1705) was a French scientific instrument inventor and physicist, best known for his work on [friction](#) and [temperature measurement](#). He was one of the pioneers in studying the problem of friction, that is the resistance to motion where bodies are in contact.

Guillaume Amontons: Portrait from <https://prabook.com/web/quillaume.amontons/3727681>

Amontons is often credited with having discovered the laws of friction (1699), though in fact his work dealt solely with static friction—*i.e.*, the friction of objects at rest. It was only after the English physicist [Sir Isaac Newton](#) formulated his laws of motion that the friction of moving bodies was analysed.

Amontons also developed an air-pressure [thermometer](#) (1702) and published two notable papers on thermometry (1702–03). He devised a method of measuring a change in temperature in terms of a proportional change in [pressure](#) of a constant mass and volume of air. This method eventually led to the concept of the [absolute zero](#) of temperature in the 19th century.

<https://www.britannica.com/biography/Guillaume-Amontons>



SAIT Training

Please see our next SAIT Training Newsletter, which will be published in the last half of March this year.

For further information please phone 011 804 3710 or email admin@sait.org.za, Isabel or Berice.

Please note: We are currently experiencing difficulties updating our website – please be patient. Thank you.

SAIT Events

SAIT Membership Fees: A reminder that SAIT Membership Fees for 2020/21 are due; relevant invoices were emailed in early April. We understand that the lockdown has caused financial difficulties, but will appreciate it if those Members who can do so pay their membership fees as soon as they are able, and let us have Proof of Payment by email at admin@sait.org.za. If you are unable to pay at this time, please contact Berice Fayard at admin@sait.org.za to arrange for continuation of your membership. Thank you.

We will keep you informed of all updates and changes to our schedule.

International Events

For a full list of upcoming international events please visit [Tribonet Conferences](#) where links take you to each event in full detail. For news on the Plenary Speakers and important dates, please read on.



Every Wednesday, a new recorded webinar is available for free to all STLE Members.

webinar topic.

We also provide links to TLT articles related to the

For more information, please go to:

https://www.stle.org/WebinarWednesdays?utm_source=Real%20Magnet&utm_medium=email&utm_campaign=156033357

Contamination Corner

An excellent article from **Reliable Plant** (Noria) lists '12 Reasons Why Bearings Fail'. More important is an outline of 'What to Look for' and 'How to Fix it'. Neatly summarised – 'This article is a guide to the major factors that can lead to bearing failure as well as how you can prevent the issues from happening. By learning more about these potential problems and knowing how to stop them, you can get the most life out of your bearings and make your application much stronger.'

The article provides a list of useful definitions relating to bearing wear characteristics. Do you have a clear understanding of the following: **False Brinelling, Fluting, and Spalling**? Obviously, the language of friction?

Contamination caused by foreign substances ranks high on the list, but a common thread is vibration which is an often-overlooked contaminant from poor installation.

<https://www.reliableplant.com/Read/30255/reasons-bearings-fail>



FAQS – Did You Know?

How about NOT reinventing the wheel?

The number of times the same question gets answered creates a database where responses are a cumulative source of valuable information.

Visit this site for 68 FAQS -

<http://www.wearcheck.co.za/useful-info/faq.html>



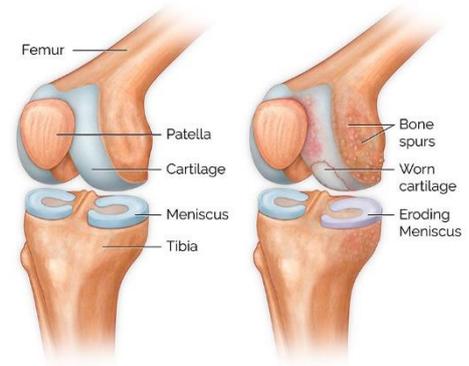
Tribology for Humans – Nanoparticles!

Nanoparticle injections into arthritic knees could slow cartilage loss.

Osteoarthritis is a painful, debilitating and fairly common condition that's hard to slow or stop, so treatment options are mostly limited to reducing pain. But a new study in mice has now found that nanotherapeutic injections into the knee can slow cartilage degradation.

Cartilage plays a key role in our joints, especially our knees, where it cushions against the forces of a lifetime of walking and running. But because it doesn't naturally repair itself, the tissue can degrade over time or due to injury, leading to the pain associated with osteoarthritis. For insight into this please visit an article by Michael Irving:

<https://newatlas.com/medical/nanoparticle-injections-arthritis-knees-slow-cartilage-loss/>



Parting Shot!



One item that the recent election in the USA has taught the world is that if enough people believe disinformation it becomes the truth from their perspective. Tribology is purist – there is no space for 'snake oil' and wild claims. It is data and science that applies to tribology. Tribology is about hard, researched fact and not what 'many people say'. But despite science, tribology is under constant attack from an economic viewpoint – there are products sold on the market where the performance does not match the labelled promise. In the absence of strongly enforceable standards, need and greed drive the system. Ignorance also plays a part – it allows price to rule the day.

As an aftermath of the pandemic, the cost of base oil and additives is escalating at a rapid rate. This will have a knock-on effect into the cost of formulated lubricants. This is not the time to opt for the "cheapest" lubricant as this will impact your cost of lubrication significantly. With energy costs also on the rise, this is the time to use energy-efficient and quality lubricants that will reduce operating costs and extend equipment life.

We Want to Hear from YOU



Please let us know what topics are of interest to you: submit interesting paragraphs or articles that we can share with the SAIT community, by sending them to admin@sait.org.za, for forwarding to The Editor. This will assist in disseminating information to all involved in Tribology.

- Please let us know what would interest you for technical sessions or webinars
- Please let us know of interesting presenters from whom you would like to hear.

We look forward to hearing from you!

Please Like the South African Institute of Tribology – SAIT – on [Facebook](#) and regularly check our [Website](#) for updates.