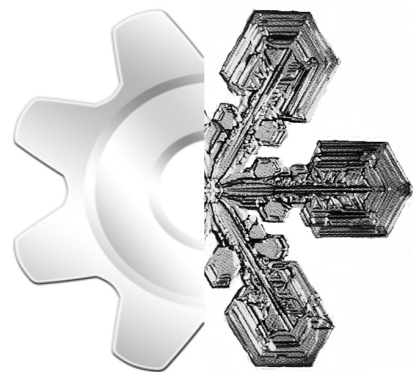


***SNOWSTORM***

***JAHRESBERICHT 2022***



***SNOWSTORM***

Das TEAM-SNOWSTORM ist ein Netzwerk aus Unternehmen, Forschungseinrichtungen und Hochschulen zur Unterstützung des Wintersports. Ziel ist es, Sportlern technische Unterstützung in Bezug auf Ausrüstung und Wettkampfvorbereitung zu geben, und den SNOWSTORM Partnern Kooperationsmöglichkeiten sowie Werbeplattformen zu bieten.

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## 1 Unterstützte Athleten

Kim Meylemans    Skeleton Team Belgium  
Ricardo Adarraga    Speedski Team Spain

## 2 Aktivitäten auf Facebook



**Team Snowstorm**

18. Januar 2022 · 🌐



Rätsel: Bei einer der vier haben wir mitgeholfen und drücken die Daumen für China.



**IBSF - International Bobsleigh & Skeleton Federation** ✓

18. Januar 2022 · 🌐

Kimberley Bos 🇳🇱, Jaclyn Narracott 🇦🇺, Kim Meylemans 🇧🇪, Nicole Silveira 🇧🇷 - Women's #Skeleton World Cup shows success of IBSF development programme  
Athletes from small and emerging IBSF nations top #BMWIBSF World Cup and European Championships!

>>> <https://www.ibsf.org/.../22488-women-s-skeleton-world-cup...> <<<



**Team Snowstorm**

3. Februar 2022 · 🌐

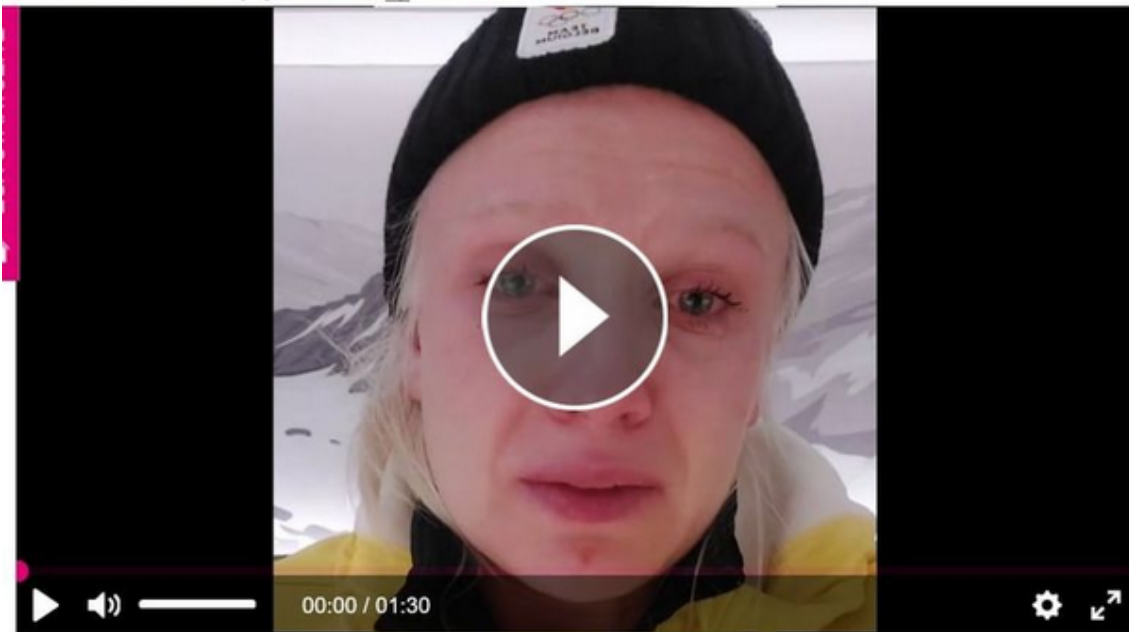


Tapfer bleiben Kim!!!

<https://www.t-online.de/.../olympia-2022-nach...>

## Nach verzweifelmtem Bericht: Olympionikin beendet Odyssee

03.02.2022, 08:05 Uhr | dpa, t-online, np





**Team Snowstorm**

16. Februar 2022 · 🌐



Fruchtbringende Zusammenarbeit mit FOM Hochschule

<https://www.fom.de/.../big-data-analyseprojekt...>



**30 Master-Studierende der FOM Hochschule analysieren im Rahmen eines Big-Data-Analyseprojektes die Fahrtdaten der deutschen Bobpiloten (Foto: AdobeStock/Dreef)**



**Team Snowstorm**

23. Februar 2022 · 🌐



Behle auf Eurosport: Eine fachlich sehr zutreffende Einschätzung von Jochen Behle mit einem kleinen Mangel. Es handelt sich nicht um C8 Fluoride (Fluorid gibt es in der Zahnpasta), sondern um fluorierte Alkane mit 8 C-Atomen.

<https://www.eurosport.de/.../deutschland.../story.shtml>

## BETRUG MIT C8-WACHS BEI OLYMPIA? JOCHEN BEHLE BEWERTET VORWÜRFE GEGEN DEUTSCHES TEAM

Die deutschen Skilangläuferinnen haben bei Olympia in Peking mit Silber in der Staffel und Gold im Teamsprint geblüht. Kurz darauf tauchte das Gerücht auf, die Mannschaft von Bundestrainer Peter Schlickennieder habe das verbotene C8-Wachs eingesetzt. Nur: Was verbirgt sich hinter dem Wachs und hätte sich wirklich ein Vorteil ergeben? Ex-Bundestrainer Jochen Behle klärt bei Eurosport auf.





Team Snowstorm

5. April 2022 · 🌐



Gestern in der spanischen Sportpresse, hier die Übersetzung.  
Snowstorm Glückwünsche an [Ricardo Adarraga](#)!  
[https://as.com/.../04/polideportivo/1649081554\\_499867.html](https://as.com/.../04/polideportivo/1649081554_499867.html)

SPEED SKI | WELTMEISTERSCHAFT

## Origone und Greggio gewinnen den Crystal Globe und Adarraga schreibt Geschichte: Top-10 insgesamt

Die beiden italienischen Skifahrer gewannen die Gesamtwertung in der Kategorie. Adarraga ist der erste Spanier in der Geschichte, der in den Top-10 des Overall Speed Ski World Cup gelandet ist.

As.com

Veröffentlicht am: 04 April 2022 16:12 CEST



Diario online  
deportivo

...am Ende ...en konnte der Schussel war die ...am Ende  
aller Tests zwischen Platz 9 und 15. Besonderen Dank richte ich an Hans-Martin Heierling aus Davos, **Professor Matthias Scherge** vom Karlsruher Institut für Technologie und das Fraunhofer-Institut sowie an Aerodynamikprofessor Flavio Noca von der Geneva Engineering School HEPIA, die mir im technologischen Bereich so viel geholfen haben."



**Team Snowstorm**

22. Mai 2022 · 🌐



Heute in Winterberg: Nachwuchs auf unserer neuen [Glice Hockey](#) Anschubstrecke powered by Team Snowstorm.







**Team Snowstorm**

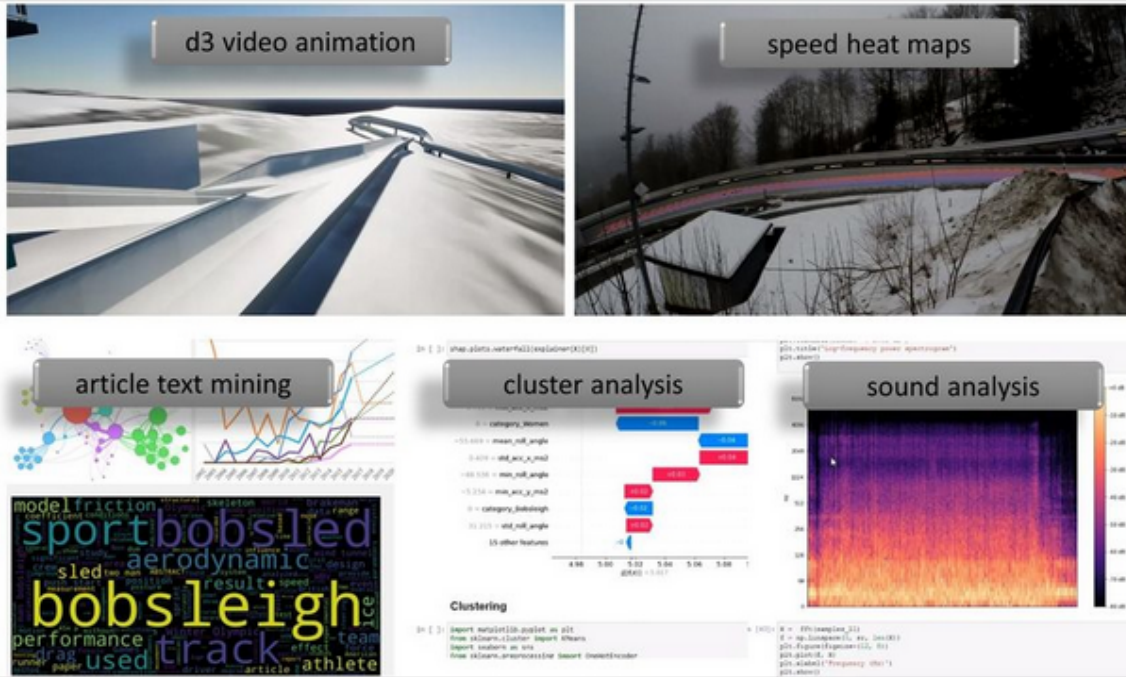
2. Juli 2022 · 🌐



Mit Daten Stürze vermeiden:

Nach ca. einem Jahr intensiver Programmierarbeit mit 30 Big Data Cracks können wir nunmehr Athleten und Trainern exakte Rückmeldungen zu kritischen Fahrsituationen geben.

Mehr Infos bei: [bobrun@team-snowstorm.de](mailto:bobrun@team-snowstorm.de)





**Team Snowstorm**

2. November 2022 · 🌐

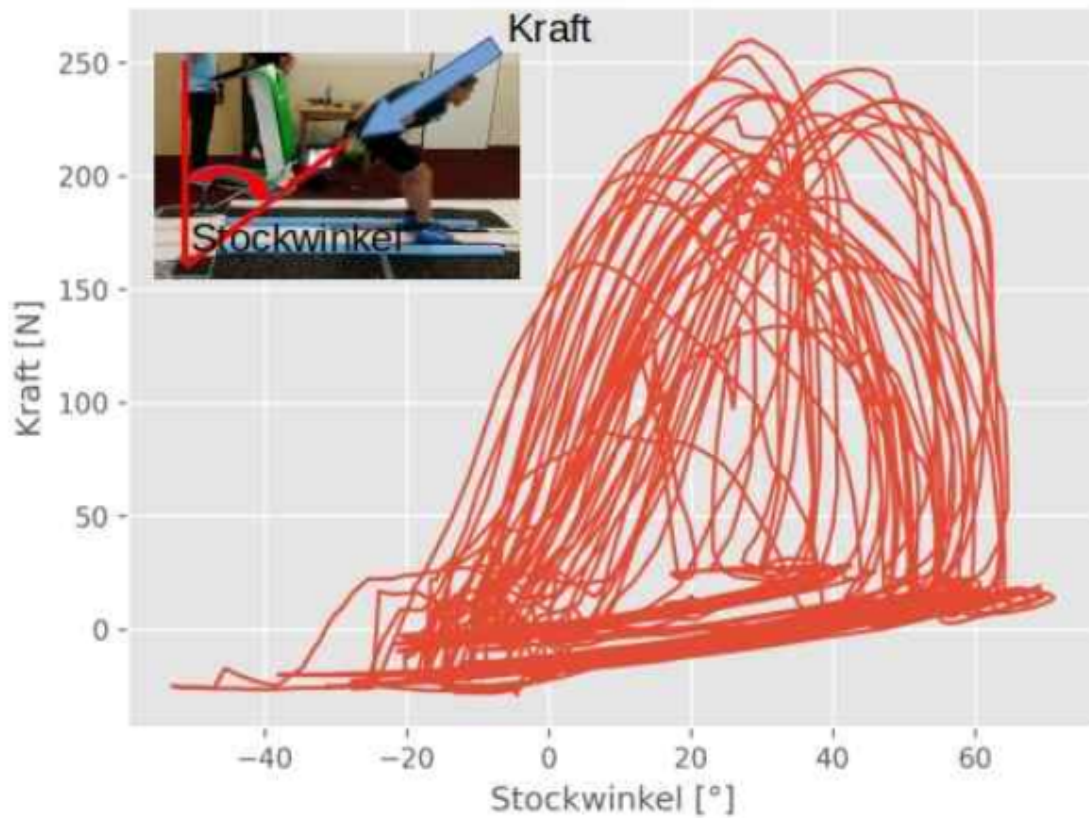


Team Snowstorm macht gerade Urlaub.





Dass Langlauf nicht nur in freier Natur sondern auch im Diagramm sehr harmonisch aussehen kann, zeigt dieses Bild. Man kann aus diesem Bild schon viel über die Langlauftechnik lernen, z.B., dass noch großer Optimierungsbedarf in der Gleichmäßigkeit der Stockführung besteht. Noch deutlicher fällt die Analyse aus, wenn man in die Auswertung die beiden anderen Stockwinkel und die Beschleunigungen einbezieht.



### 3 Aktivitäten auf LinkedIn

#### Cellular power plants and HIIT

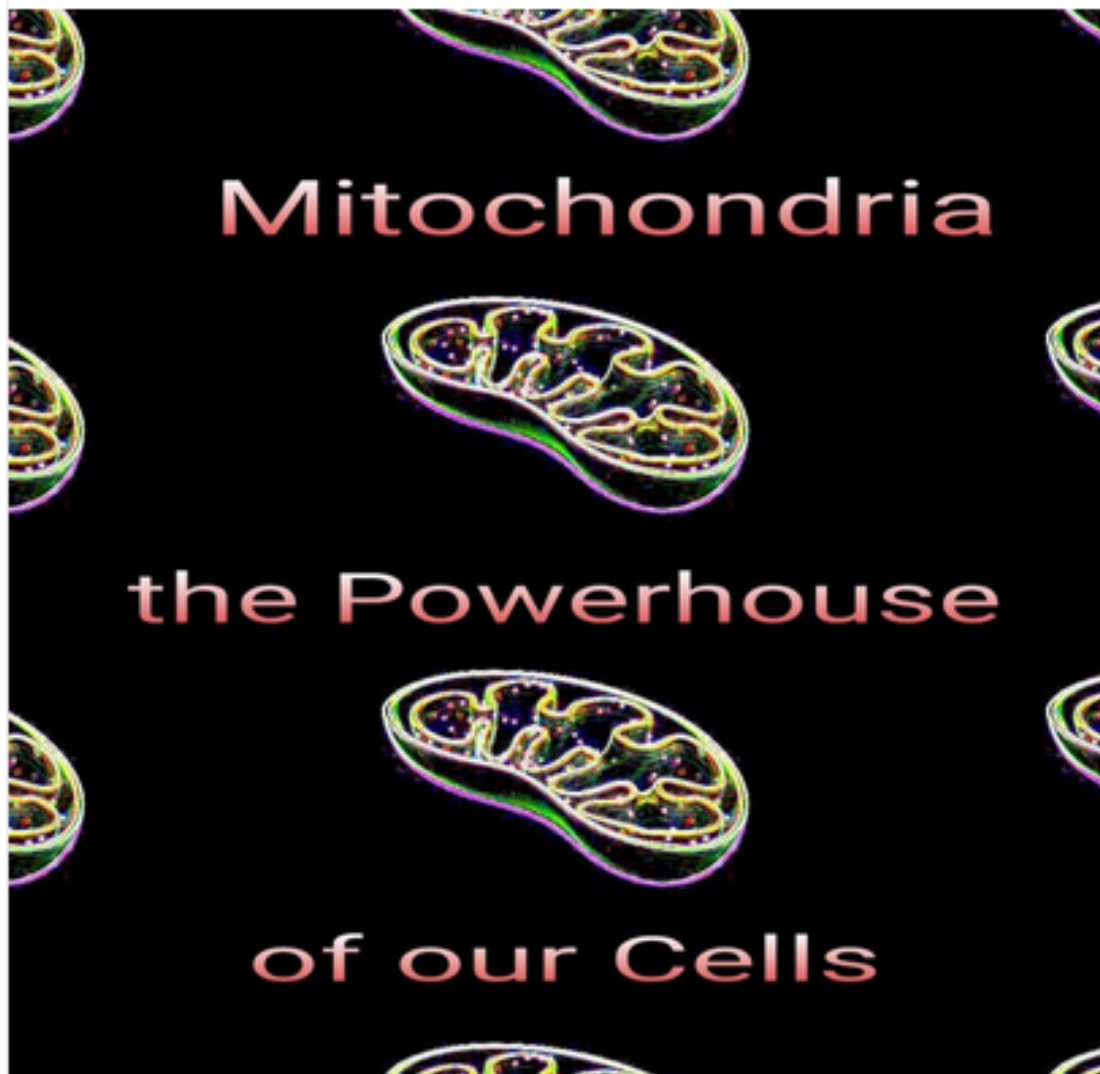
Scientists from Australia and Germany were recently able to show how mitochondria respond to training stimuli. Using muscle biopsies and biomarkers, athletes were studied after completing defined training volumes. The workouts were designed to include varying numbers of HIIT components.

According to the study, 185 proteins are involved in the provision of energy in the mitochondria, representing several functional protein classes as well as bioenergetic and metabolic pathways. It was shown that the exercise-induced increase in the formation and proliferation of mitochondria is favored by activation of the electronic processes involved in the formation of ATP.

Although the influence of training duration cannot be completely excluded, it became clear that the training volume is the decisive factor. The training with the highest HIIT percentage showed the greatest effect.

<https://lnkd.in/dFtMtguh>

#training #hiit



Snowstorm Publishing: Gliding enters its seventh year. With more than 50,000 downloads of articles in 2021, the total number of views has risen to 300,000. This year we will start with an article on double poling.

<https://lnkd.in/d4rRPCf>

[#journalismus](#) [#wintersport](#) [#skifahren](#)



What is the difference between (m × g) and (k × x) strength training? Which of the two workouts is more efficient for developing solid cross-country endurance? What do you think?

[#cross](#) country [#training](#) [#strength](#) training



 1

Is there anyone who has experience with the Skiselector?

<https://lnkd.in/dqDVPMup>

An optimal pressure distribution is essential for good gliding. We test this with the pressure measuring plate from **molibso Entwicklungs- und Vertriebs GmbH**.



Dr. **Mathias Wernbom** is a physiotherapist working at the University of Gothenburg in the field of exercise physiology. Currently, he is mainly focused on research in strength training and muscle adaptation (occlusion training or ischemic strength training) within a development program of the Swedish Olympic Committee.

The strength training is performed under low load and blood flow restriction. With the help of a pressure cuff, the blood supply to the working muscles is intentionally reduced and thus temporarily deprived of sufficient oxygen. Good results have been achieved, especially in patients with cruciate ligament problems.

Light weight training can lead to growth in both slow and fast twitch muscle fibers. Training has been adapted to increase explosiveness and speed of athletes.

<https://lnkd.in/d37f3V2b>

[#training](#) [#skiing](#)





Will only outsiders win at the Olympics?

A new article by Sandbakk and colleagues from Sweden suggests so. Maximum oxygen saturation drops linearly by an average of 6.3% per 1000 m altitude difference. Flatlanders will have a hard time here! The competitions take place at about 1700 m. In addition, greater decreases in saturation are seen in well-trained endurance athletes compared to athletes with less endurance. In addition, athletes often report decreased duration and quality of their sleep at altitude. This calls for a long acclimatization period. Problematically, the number of doping tests has decreased significantly due to the pandemic. The authors suggest that manipulation of the volume of erythrocytes in the blood may occur in order to improve oxygen transport.

The article ends with a whole series of valuable hints for preparation, but immediately restricts again in the next sentence:

"Although we hope that these recommendations will be helpful in preparing for the Beijing Winter Olympics in 2022, many of them are based on experience in combination with insufficient scientific evidence."

<https://lnkd.in/dwi3stB6>

[#olympics](#)



After Claudia Buckenmaier (ARD correspondent in Washington) and **Ranga Yogeshwar**, I had the honor yesterday to give a lecture on the topic of technical preparation for the Paralympic Games to the recipients of the Germany Scholarship of the **Karlsruher Institut für Technologie (KIT)**. It was about ski, snow, biomechanics and weather.



Some like it hot:

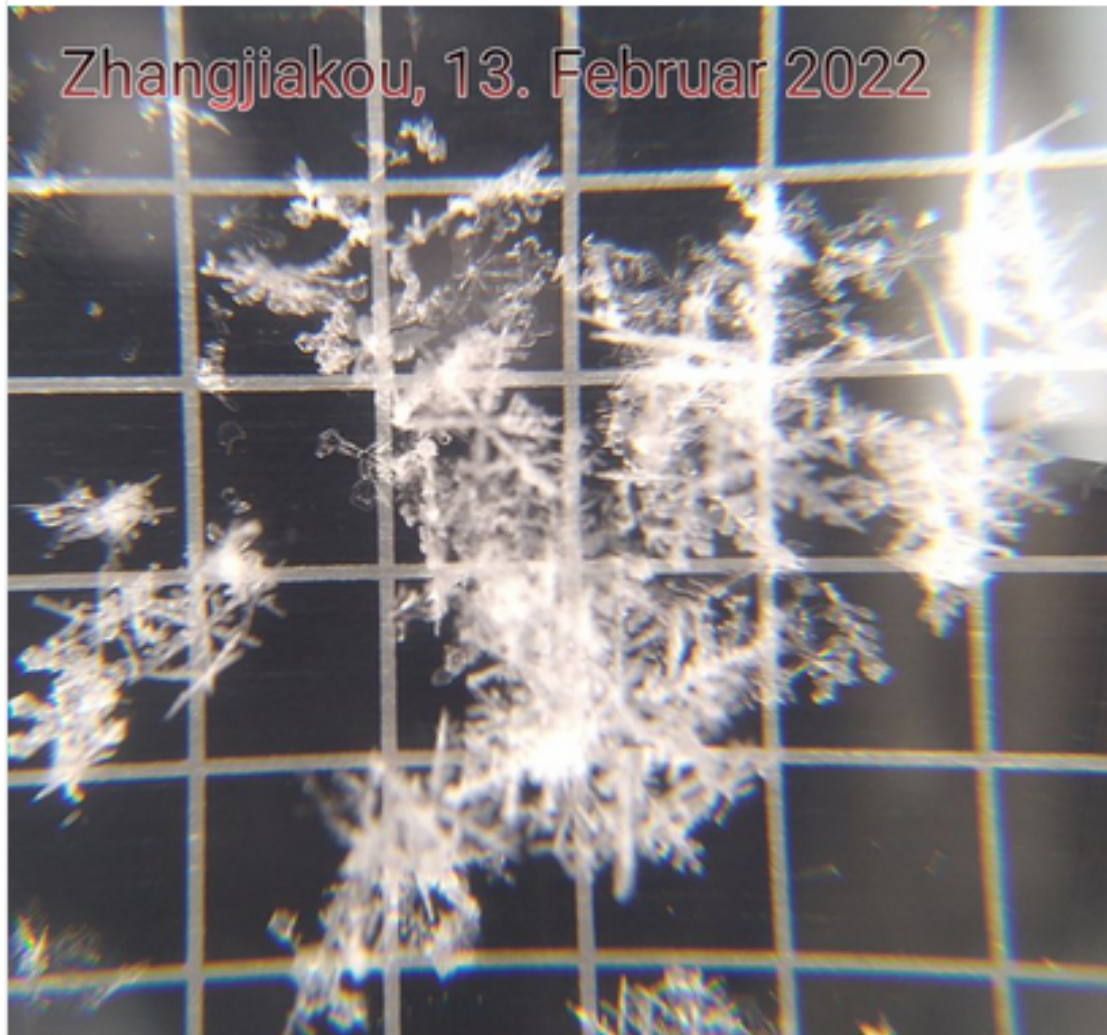
<https://lnkd.in/dh8UKJ7F>

#Olympics #skiing



Biathlon. Why it was very hard for some today. Cold snow calls for fine grinding structures, but not when there was cold fresh snow, as the current picture shows. The flakes break down into individual ice needles that clog the fine grooves. Problem solution: either no fine grinding structure or a grind without longitudinal grooves.

[#Olympics](#) [#biathlon](#)



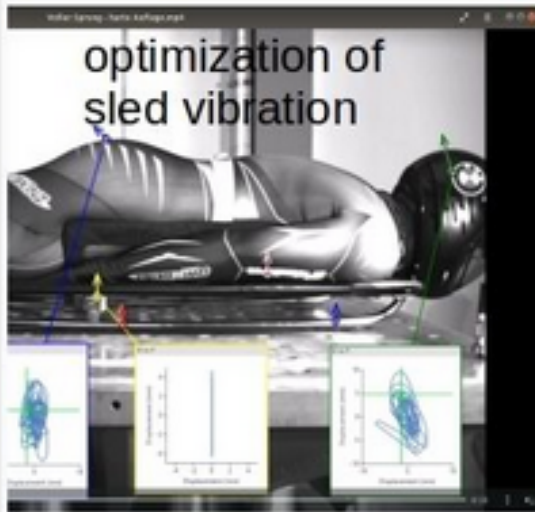
Yesterday Deutschlandfunk Nova called me and asked me for my assessment of why we have already won so many medals in bobsledding. You can find my assessment in (mainly) the words of the interviewer and me at:

<https://lnkd.in/dAFAmWVU>



What started out strong was abruptly thwarted by Corona. We keep on pushing!

#olympics

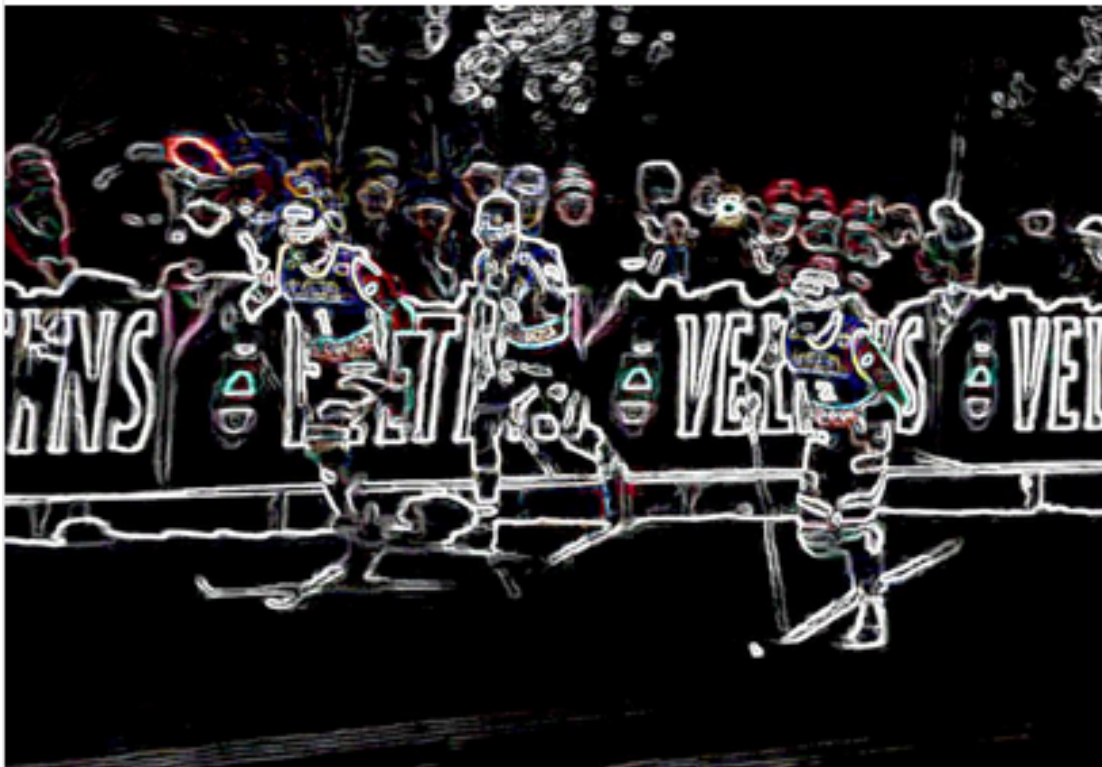


### Walk like a Klaebo

New findings published in the *Journal of Sport and Health Science*, suggest that the "Klaebo walk" produces higher acceleration due to faster propulsion and more pronounced flexion and extension of the knee joint, along with prolonged leg extension, leading to higher top speeds than the conventional technique on the mountain. The authors from Italy and Sweden suggest that due to the higher ski load at the moment of ski stop, at least theoretically, the need for climbing wax is reduced.

Comment M.S.: However, I cannot agree with this assumption, since increased normal force leads to smaller friction between ski and snow, which as a consequence requires more climbing wax.

<https://lnkd.in/dZwNP9Rs>



Like ski, these leaves do not love excess water. However, the hydrophobizing solution shown here is sustainable, genuinely green and holds a certain moment of happiness.





Nice to see when a longtime friend succeeds! Hopp Schwiiz! Hopp Hansjürg! Kessler Snowboards - the Brand of Olympic Champions.

[#snowboard](#)



Rondo Magazin

Muscle fiber type and endurance performance - A contribution from Holland and France.

Muscle fiber type, cross-sectional area, mitochondrial volume density or function, and capillarization can now be determined with confidence. Nevertheless, the relationships between these variables and their effects on endurance performance are largely unexplored.

This article shows that comprehensive assessment of the above factors indicates efficient type I fibers with high mitochondrial oxidative capacity. Well-developed oxygen supply through capillarization and adequate myoglobin concentrations ensure endurance performance.

Optimization of endurance performance requires careful planning of training interventions that include fine-tuning of training intensity, frequency, and duration, and especially periodization with respect to skeletal muscle factors.

[https://lnkd.in/d\\_-FQRdK](https://lnkd.in/d_-FQRdK) #training #skiing



No one lesser than Lesser. A great one leaves.  
(E.L. and M.S. 2014 in Oberhof)



15,000 downloads in 1 week !!!

<https://lnkd.in/dHeGreHk>

#training #skiing



Another great says goodbye to the international stage: Martin Fleig from Nordic Paraski Team Germany.

[#paralympics](#)



### News about periodization

In an Italian study, each runner completed one of the following 16-week training interventions: a pyramidal periodization (PYR); a polarized Periodization (POL); a pyramidal periodization followed by a polarized periodization (PYR → POL); and a polarized periodization followed by a pyramidal periodization (POL → PYR). Body mass, speed at different blood lactate concentrations, absolute and relative peak oxygen consumption, and 5 km run performance were measured.

The switch from pyramidal to polarized training after 8 weeks yielded the best results compared with the other periodization modes. Participants in the PYR → POL group showed the greatest improvement in the following variables: ~3.0% for relative oxygen saturation, ~1.5% in 5 km run performance.

<https://lnkd.in/dhzZ86mn>

#Training #skiing



In the service of friction science in front of the cameras of **blubb.media GmbH**. The information about the why is available on May 20.

**#science #sciencenews**



Off to new shores (in German: Ufern)!

On his website you can read: "**Dr. Michele Ufer** has experienced it all as an extreme runner: 54 degrees in the Namib Desert, snow in the Arctic Circle, 100 percent humidity in the Amazon rainforest and thin air at high altitude on Mount Everest. He runs distances of 250 kilometers and beyond."

What he hasn't experienced, however, are cross-country races, and that's what we talked about this afternoon. I was particularly interested in mental preparation of long races for masters athletes and learned a lot.

<https://lnkd.in/d2i7NpJS>

[#skiing](#) [#training](#) [#endurance](#) sports [#psychology](#)





Masters cross-country skiers were soccer players in their youth  
This is an exaggeration, of course, but there is some truth to it.  
Scientists from Austria, Germany and the USA have shown that older  
world-class world-class athletes in childhood and adolescence have trained  
more in other in sports other than their main discipline. They started their  
main sport at a later age, gained less practice in their main sport and  
achieved the best results more slowly.

Good things take time!

<https://lnkd.in/dwWHGAWp>

[#training](#) [#sports](#) [#skiing](#)



Everyday tribology

Tribosystem: Wheel - Road

Friction body 1: mica slate, hardness 6

Friction body 2: Roman wooden wheel with steel tire

Type of wear: abrasion

Depth of wear: 10 cm

Wear rate: unknown

[#science](#) [#friction](#) [#abrasion](#)



The first BEST AUTHOR AWARD for 15,000 downloads of his article on double poling skiing technique in just one week goes to:

**Andreas Laute**

<https://lnkd.in/eaEjrwy8>

**#Training #skiing #science**



### Sports and Asthma

Based on the currently available literature, Swedish sports scientists and physicians suggest that for athletes with asthma, the use of heat-moisture exchangers during exercise in subzero temperatures or dry environments may be a low-risk strategy for respiratory protection.

When respiratory discomfort occurs, even athletes with healthy airways can use such exchangers to achieve optimal prevention against respiratory damage.

<https://lnkd.in/dnrFUJq2>

[#sports](#) [#training](#) [#asthma](#)

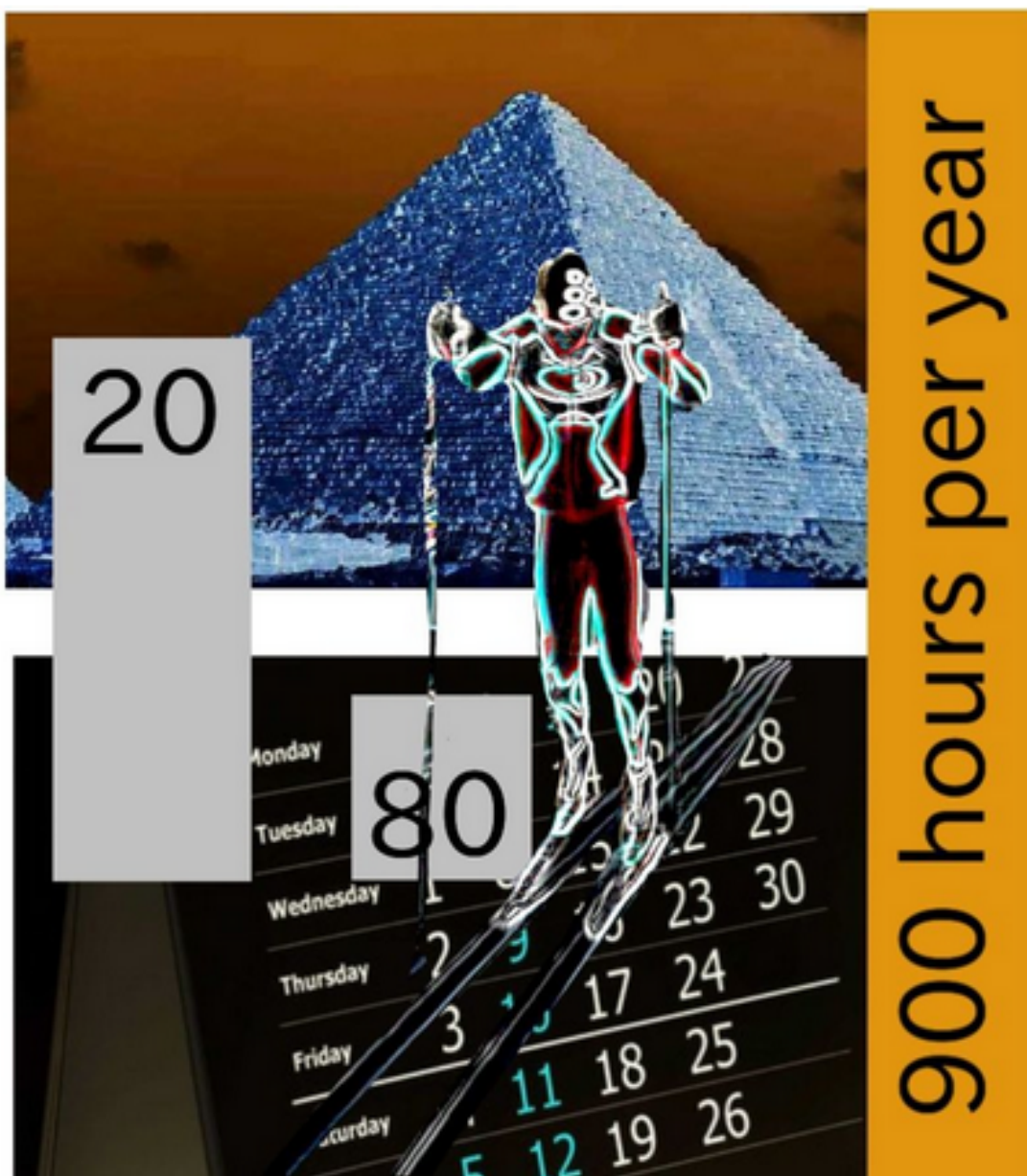


How do the pros train?

The research team around Sandbakk interviewed twelve world-class cross-country skiers about their training. The training data was evaluated in terms of training form, intensity and training mode. Training consists of high volumes (i.e.  $861 \pm 90$  h per year), at low intensity. Long-distance runners complete relatively long but few training sessions (i.e., regular 3- to 5-h sessions), use a pyramidal intensity distribution, and spend a majority (50-60%) of their training time using the DP technique. Weekly periodization includes relatively evenly distributed training loads. However, all runners have a distinct periodization pattern.

<https://lnkd.in/e9FEr5hc>

#training #skiing



After how many kilometers is there no more fluorine wax on the ski?  
Colleagues from Innsbruck have investigated this question and measured the reduction in the amount of wax at  $-2^{\circ}\text{C}$  and at  $-18^{\circ}\text{C}$  with their giant ski tribometer. While the wax hardly wears off at  $-2^{\circ}\text{C}$ , the amount of fluorinated wax had dropped to 20% of the initial concentration at  $-18^{\circ}\text{C}$  and about 2 km of gliding distance. Fluorinated wax wear is also affected by position along the ski base, and wear was highest at the ski tip. Finally, it was shown that fluorinated waxes are not always the best choice and other waxes may be superior in colder and harder snow conditions. The picture shows me on a visit to Innsbruck. I am standing at the beginning of the approx. 20 m long gliding run. I am still warm. A short time later, I'm wearing a warm suit, gloves and wool cap.

[https://lnkd.in/e3bW\\_q3s](https://lnkd.in/e3bW_q3s)



Today rolling friction. But what does this mean in numbers for the coefficient of friction?

-ski on wet snow: 0.5

-ski on very cold snow: 0.1

-very well prepared ski on competition snow: 0.01

-rolling friction: 0.005, when the tires are fully inflated and the asphalt is flat

**#tribology #Training #competition**



Yesterday, I swapped my tracksuit for a fine suit. In Hamburg, I was able to pick up the €50,000 science award from the Deutscher Stifterverband (German Donors' Association). The prize honors 25 years of research into friction and wear.

**#science #engineering**





Today in Winterberg. Olympic champion **Laura Nolte** and Olympic participant Alexander Gassner inspect our new push track. Thanks to **Michael Wenzl** and BSC Winterberg!

**#skeleton #bobsled #training #biomechanics**



Using artificial and natural intelligence data from the sport of Bobsledding analyzed (and presented yesterday in Essen):

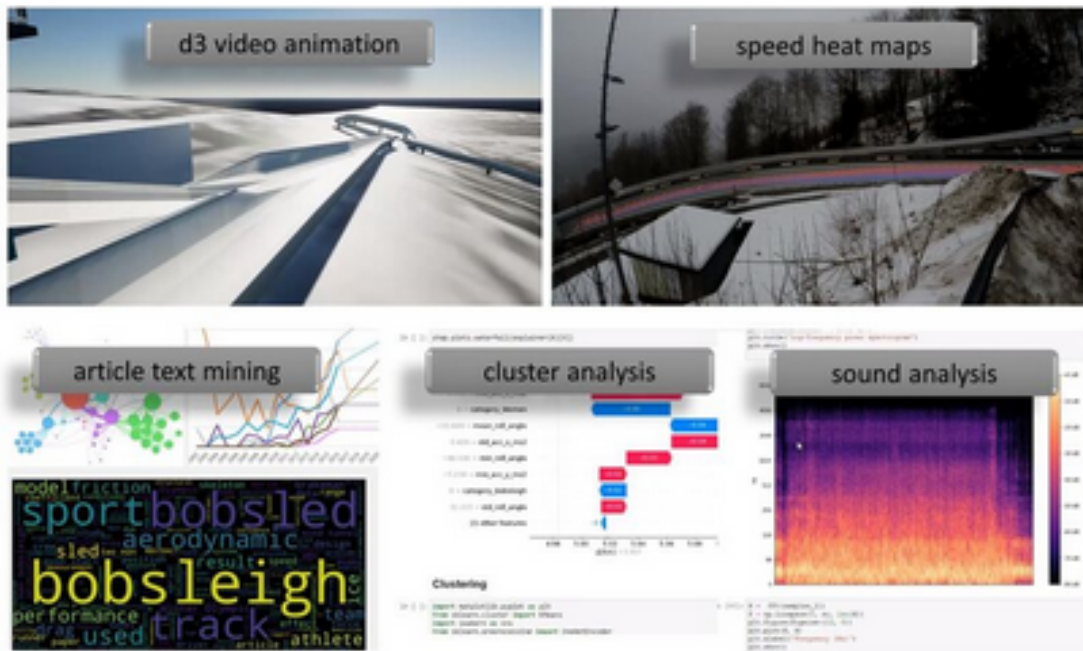
Sensors inside bobsleds and on the track provide data in abundance. In fact, there is so much data that it is no longer possible to evaluate it manually. Video, sound, speed, acceleration and position data, when combined, contain valuable information for coaches and athletes. AI and machine learning are valuable helpers here.

**#ai #machinelearning #intelligence #data #video**



## Conference Recap

After 8 months of intensive programming work by 30 IT experts, supervised by **Rüdiger Buchkremer PhD**, Andreas Neagi ... mehr anzeigen



Found today in the latest issue of [sportärztezeitung thesportgroup](#):

Stress from Sports – The Gut - Brain - Axis.

Author and alternative practitioner **Tom Fox** writes: "It is estimated that about more than half of all athletes suffer from stress due to over-exertion and insufficient recovery." The latter is especially prevalent among older athletes who have to balance sports, career and family. In addition to treatment options, the author also describes criteria and early indicators to watch out for. Worth reading.

(many of the articles in sportärztezeitung can also be found online:

<https://lnkd.in/eW2XdctT>)

**#Sport #Training**



Lucky again

Friction not only generates heat, but also changes materials near the surface. Rubbed by many hands, the small trunk reflects because the metal has become corrosion resistant. This is gentle finishing, which also increases wear resistance.

Mechanism: tribochemical reaction after plastic flow.

<https://lnkd.in/eGi9aWV7>

[#tribology](#) [#chemistry](#)

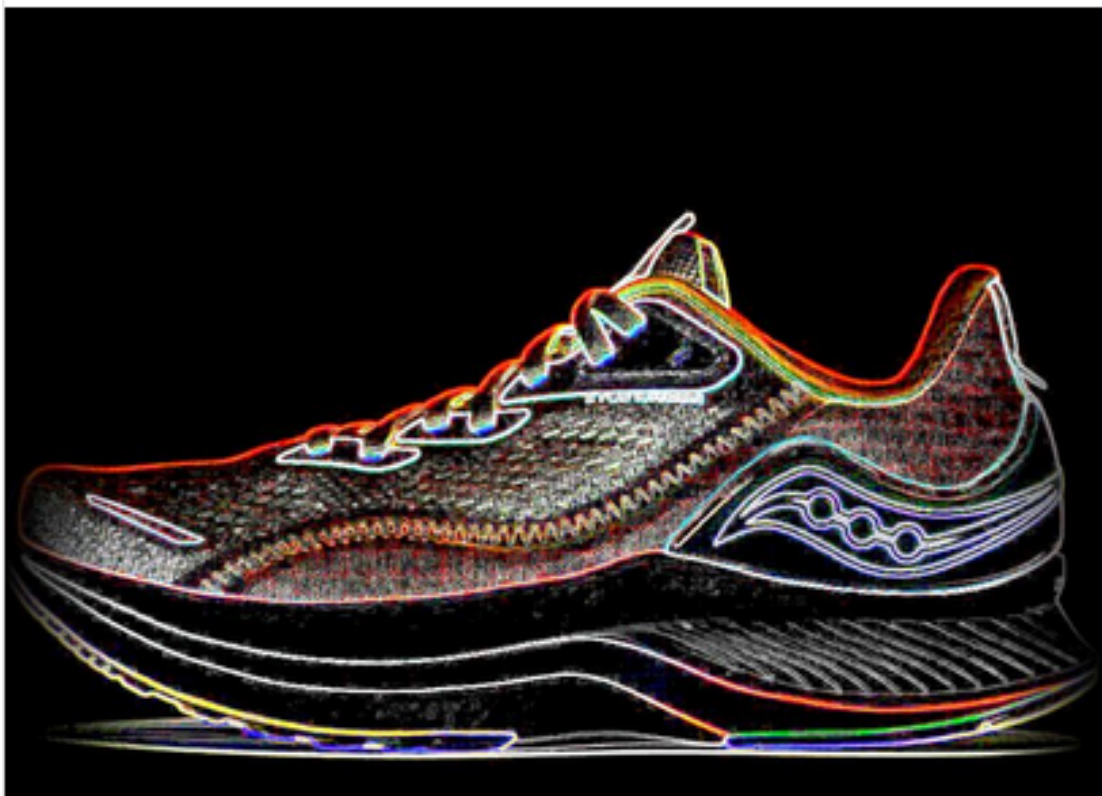


### The biomechanics of the new seven-mile boots

American researchers from Utah took a closer look at the Saucony Endorphin Pro and answered the question of whether these shoes provide benefits in the field. Tests (oxygen uptake, ground reaction forces, and lower body kinematics) were conducted on the flat, uphill, and downhill. It was hypothesized that the new type of shoe would be less effective uphill than downhill because the ground reaction forces are greater, and thus the elastic energy storage in the shoe is greater when running downhill. What came out was this: Similar metabolic benefits were found regardless of terrain. No major savings in oxygen cost during downhill running were found. Given the current state of the art, the authors suggest that these new shoe models are not needed specifically for moderate inclines or declines.

**#running #training #shoes**

<https://lnkd.in/evf5ke6f>



### The secrets of endurance

Sports scientists from Oslo have been very industrious and have evaluated about 200 literature sources on endurance research. Long-distance runners participate in 6 to 9 competitions per year. The typical weekly running workload in the mid-preparation phase is in the range of 130 to 220 km. In addition, more than 80% of the total running distance is completed at low intensity. The focus is on building the aerobic base. The closer the main competition, the more the distribution of training intensity varies across the mesocycles. The reduction of the training program starts 7-10 days before the main competition. Those who can afford it still complete a 2-4 week altitude training camp.

[https://lnkd.in/eUf8p\\_\\_q](https://lnkd.in/eUf8p__q)

[#endurance](#) [#training](#) [#research](#) [#sportsbusiness](#) [#running](#)



How much cycling is good for cross-country skiing fitness?

In a 2017 study, the training of the most successful cross-country skiers of all time at the peak of their performance was examined. The runners earned six gold medals at the Olympics, 18 gold medals at World Championships and 110 World Cup victories.

Training diaries, interviews and physiological tests were physiological tests. Training data were systematized by training form (endurance, strength, and speed, intensity), and the type of training (running, cycling and skiing/roller skiing) as well as periodization were evaluated.

The result: 63% of the annual endurance and sprint training were skating and classic technique and roller skiing, while 34% was devoted to running and 3% was used for cycling.

<https://lnkd.in/eBM9SRHy>

[#training](#) [#skiing](#) [#endurance](#) [#cycling](#)







Snowstorm  
Publishing

# GLIDING

Open Access Journal Devoted to the Field of Gliding  
Against Snow, Ice and Water

online since 2016  
17 authors

42 articles

more than 300,000 downloads



volume 27  
ISSN 2509-1422

articles 1 - 5

pages 1 - 29



**Alex Kopacz** • 1.

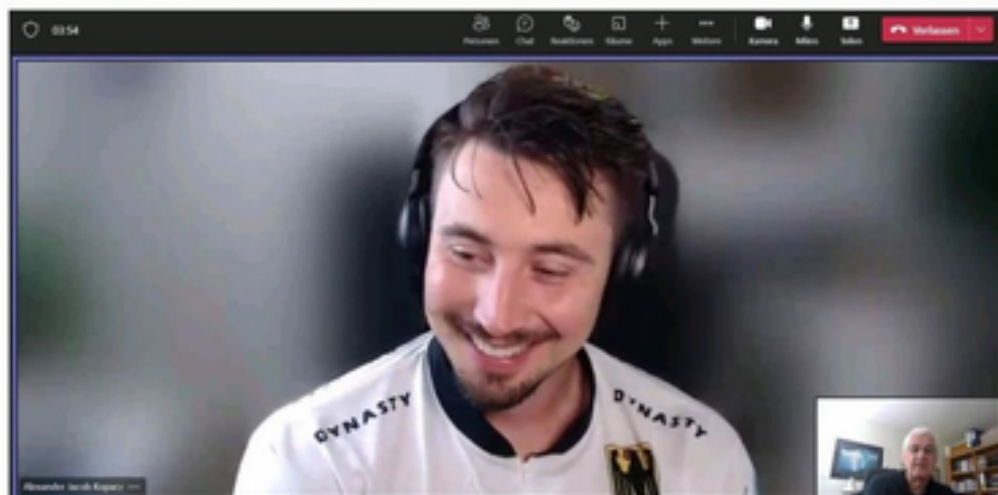
Every solution starts with a step in the right direction

10 Monate • 🌐

last week I had the pleasure to speak with **Prof. Dr. Matthias Scherge**. We discussed science in sliding sports, current state of the art as well as the hope for making the sport even more exciting through shared knowledge. **Karlsruhe Institute of Technology (KIT)**

es war mir eine Ehre zum Reden mit Prof.Dr. Mattias Scherge über Bob- und Schlittensport und aktuelle Wissenschaft und Anwendungen für Leistung im diese Sportarten

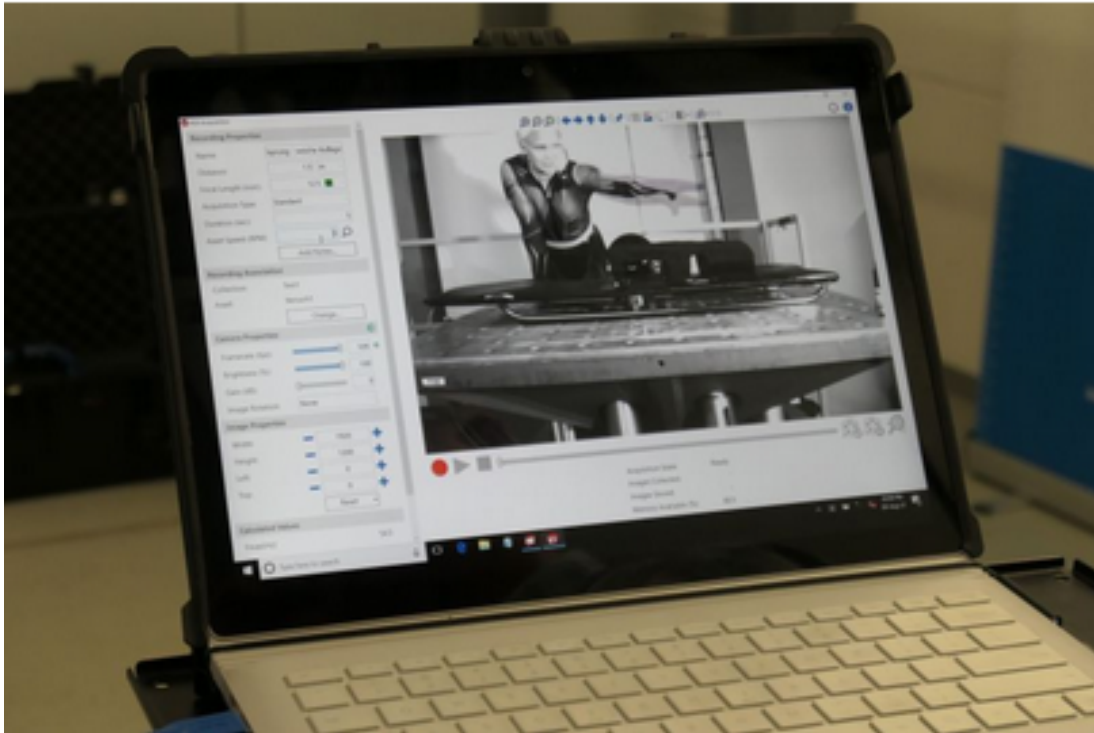
[Übersetzung anzeigen](#)



Snowstorm Publishing GLIDING devotes a crisp one-pager to the problem of vibrations in skeleton sports.

<https://lnkd.in/eFRde5rZ>

[#olympics](#) [#training](#) [#competition](#) [#vibration](#)



### Plyometrics in cross country skiing training

Plyometrics is a type of high-speed strength training that addresses the rapid stretch reflex of the muscles and tendons. Plyometric exercises were used as early as the 1950s in the Soviet Union for Olympic preparation. Typical exercises are jumps, here in this study uphill and downhill. Of course, incline affects sprinting and jumping performance. Maximal leg strength is important for both sprinting and jumping uphill. Sprinting uphill and jumping downhill gives coaches and athletes an effective and inexpensive training method that improves the ability to combine horizontal and vertical power. Thus, this training is very well suited for cross-country skiing.

<https://lnkd.in/eyHbRYEy>

The picture shows my friend Bob Youngman doing Plyo training

<https://lnkd.in/ewQaKC-z>

[#training](#) [#skiing](#) [#Plyometrics](#) [#endurance](#) [#athletics](#)



Today with **Thomas Wick** in virtual space.

The intention was to get the former professional athlete, social media manager and brand ambassador to write an article for Snowstorm Publishing: Gliding. It seems I was successful and look forward to the article!

**#sciencenews #skiing #tribology**



### Training with Roller Skis - The Placebo of Preparation for the Winter Season

In their work on the placebo and nocebo effect in sports, Blumenstein and colleagues were able to show that an athlete's attitude toward the equipment used can influence athletic performance. Twenty-one athletes were provided with sports equipment of identical rolling resistance. Contrary to this information, some of the athletes were told that their roller had low rolling resistance, while the other group was sent off with ski rollers with supposedly high resistance. While an increase in speed due to the "better rolling" skis could not be demonstrated, the "worse rolling" skis led to a decrease in speed. On a psychological level, however, both the placebo and the nocebo effect were detectable.

<https://lnkd.in/emx7Rkiw>

[#training](#) [#skiing](#) [#placebo](#)



What good are sports watches?

A new meta-analysis (2022) looks at VO<sub>2</sub>max measurement with sports watches. The analysis suggests that measurement with exercise-based algorithms has higher accuracy than those taken at rest. However, the measurement error (the study speaks of estimation) is large at the individual level, so its use for sports/clinical purposes needs further improvement.

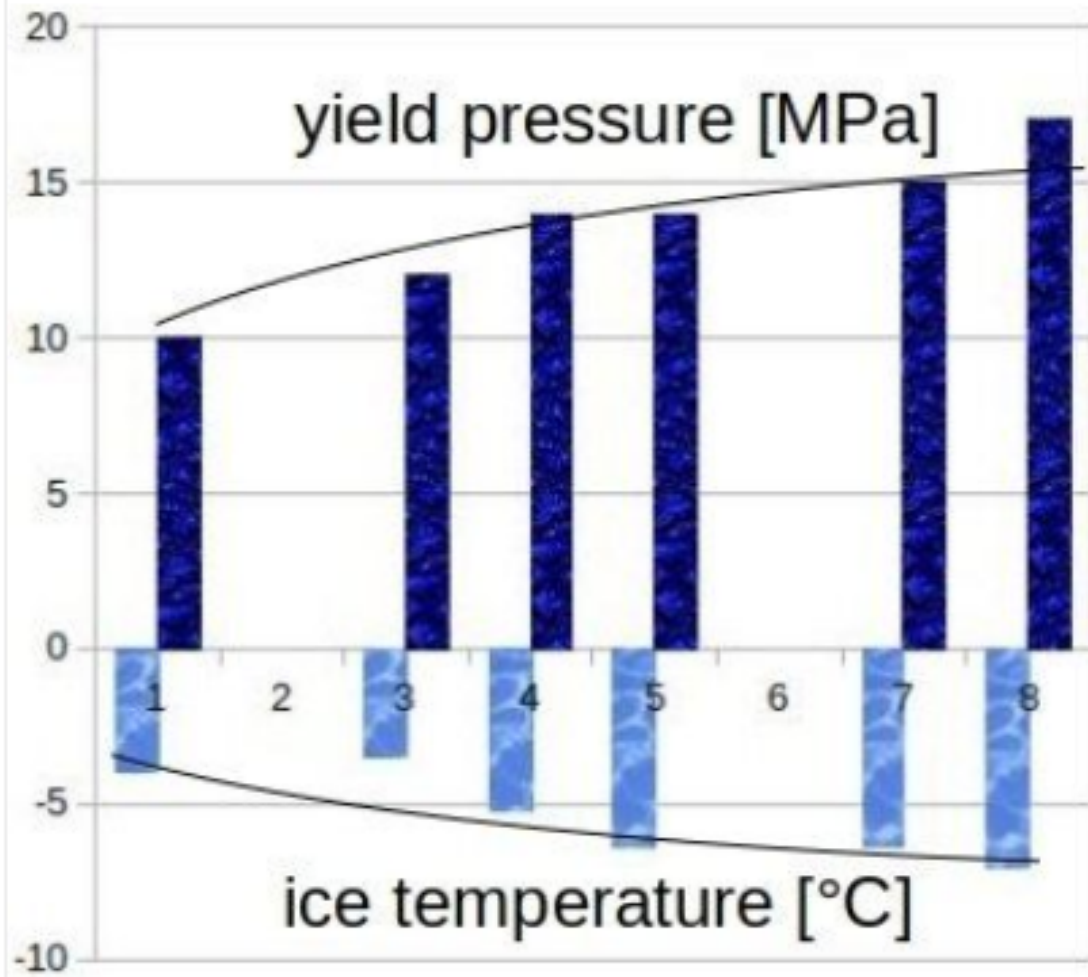
Comment M.S.: Very diplomatically put.

<https://lnkd.in/dp9AExt8>



Contact mechanics and ice destruction. Our new one-pager.

<https://lnkd.in/eNdnrctR>





### Skiing under pressure

Compression garments, stockings, shirts or pants are in vogue. But does the pressure generated deliver what it promises? Colleagues from down under have investigated this and evaluated 183 studies. Here's the result: There is a lack of clear evidence that the use of compression clothing affects the heart and vascular system and the body's ability to supply oxygen to the muscles and heart during sustained physical activity. However, compression garments increase skin temperature at the point of coverage and heat retention during and after exercise. The sensation of muscle soreness and soreness in the days following exercise is reduced. Research to date does not indicate that compression garments have a negative effect on performance.

Note M.S.: Placebo?

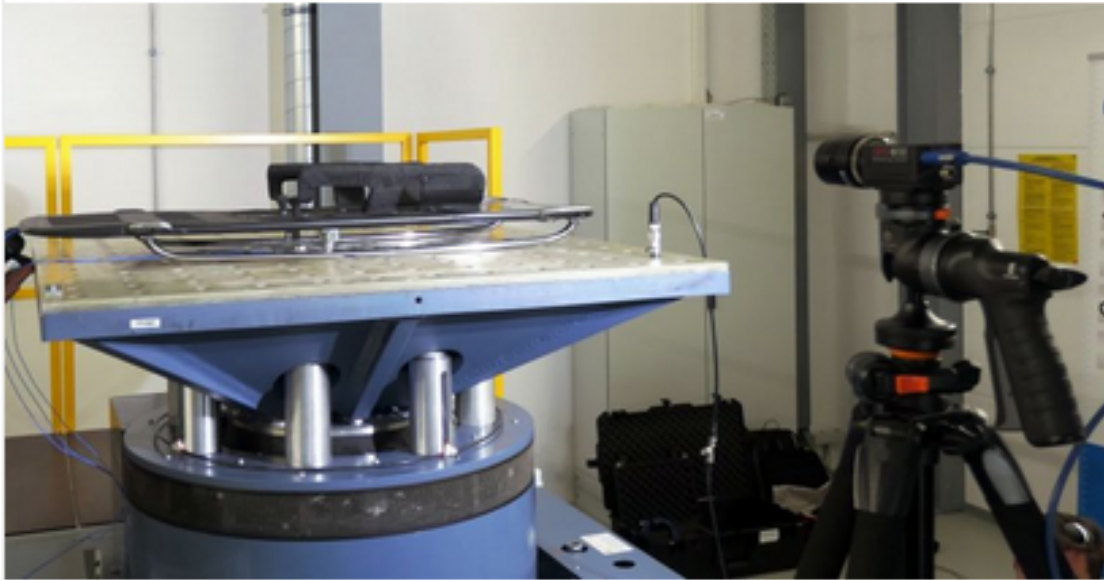
<https://lnkd.in/egmMcVUj>



Our third one-pager deals with the visualization of vibrations. Have a look at:

<https://lnkd.in/ezevKctf>

Many thanks go to Team Snowstorm partners **RDI Technologies Inc.** for providing the equipment and to **Frank Ringsdorf** as well as **Dominik Wrona** of **VIMS Verified Industrial Maintenance Solutions** for performing the tests !



### Influence of the pole length

A greater top speed can be achieved with poles that have a length of 84% of the body height than with 90% poles. However, O<sub>2</sub> costs and the elevation of one's center of mass were higher with 90% vs. 84% pole length at moderate speeds. See:

<https://lnkd.in/ePJzeQ9U>

[#skiing](#) [#competition](#) [#training](#) [#doublepoling](#)



Today new at [xc-ski.de](https://xc-ski.de):

<https://lnkd.in/ezrdxdBh>

#xc-skiing #training #hallux #returntosports



**Wissenschaft: Hallux valgus und Langlauf, geht das? - xc-ski.de Langlauf**

xc-ski.de • Lesedauer: 2 Min.

During ski roller measurements on the treadmill at 5% and a 12% incline, which is not normally run in double pole technique, pole use was analyzed. Measurements were made at low, medium and high power output (measured via pole forces).

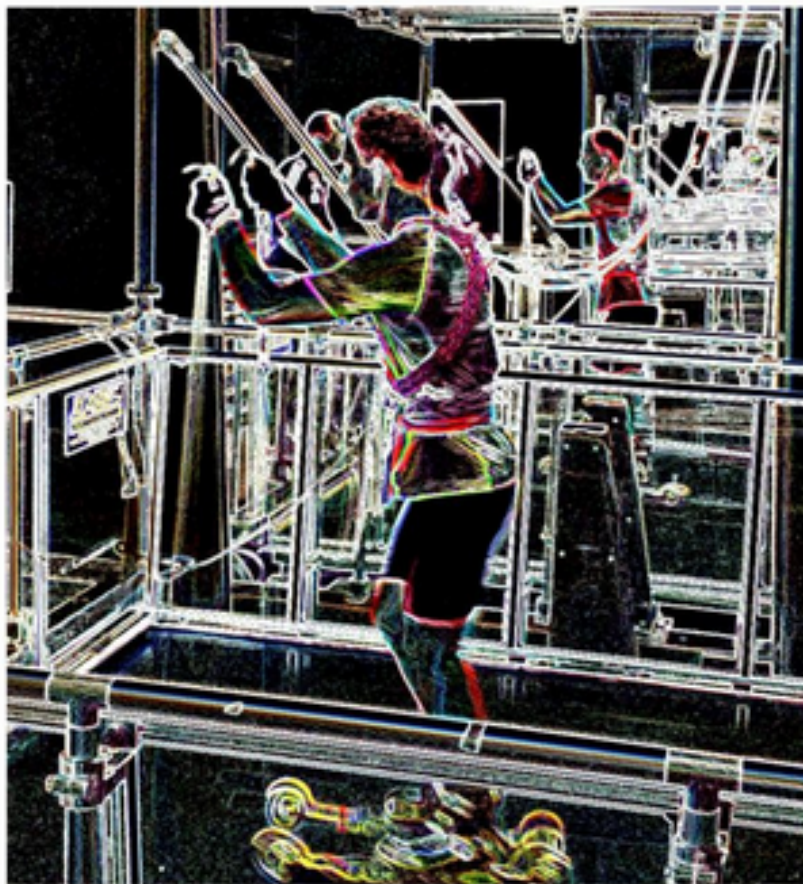
In motion, at 5% incline, the arms contributed 63% of the total power output. At 12%, it was only 54%, which is surprising. The missing power shares were provided by trunk and legs.

Comment M.S.: This study impressively proves that the double pole technique requires the musculature of the entire body and thus gives clear indications for a strength training that addresses the upper body musculature and that of the legs equally.

<https://lnkd.in/dRNXHnWd>

#training #skiing

5% --> 63%

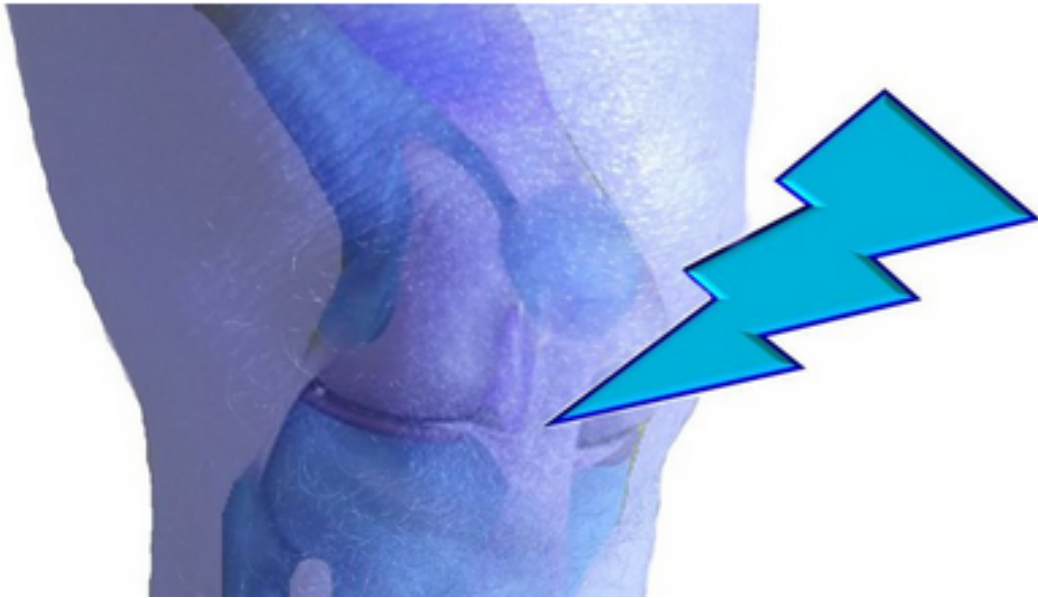


12% --> 54%

### Injuries in cross-country skiing

In a year-long monthly survey of injuries and training loads in elite adult North American cross-country skiers, new injuries were found to be associated with previous injuries. Lower extremity injuries and nontraumatic overuse injuries had the greatest frequency. There was no significant relationship between new injuries and training load.  
Comment M.S.: A safe sport.

<https://lnkd.in/e-KbmTYr>  
[#training](#) [#skiing](#) [#injury](#)



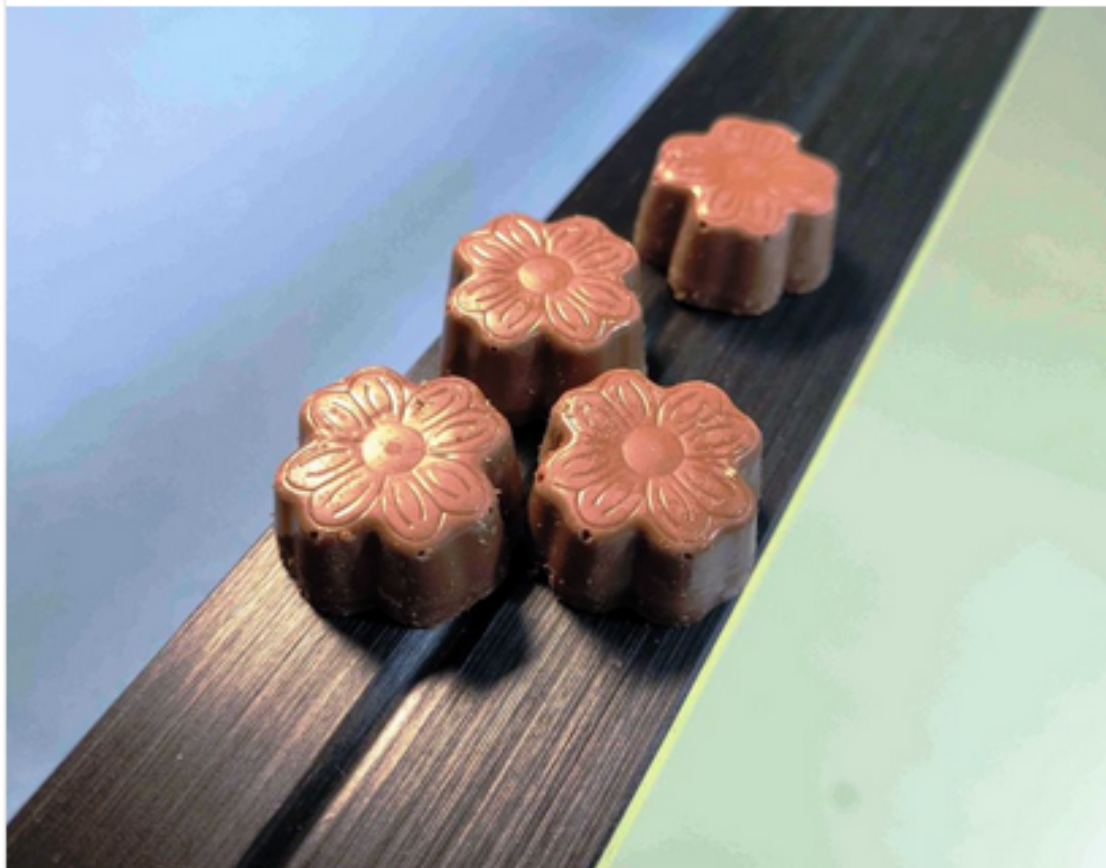
### The little sweet in between

Carbohydrates ingested as ergogenic substances during prolonged exercise have a positive effect and are scientifically well documented. In cross-country skiing, however, there are only a few studies. Ergogenic substances enhance a person's performance in sports. One well-known substance is caffeine.

A Swedish study has now shown that ingestion of a relatively highly concentrated maltodextrin-fructose-CHO gel during moderately intense whole-body training (diagonal XC skiing at ~70% of VO<sub>2</sub>max) in a cold environment had no ergogenic effect on subsequent maximal upper body performance.

<https://lnkd.in/emY5BuMf>

[#training](#) [#sports](#) [#nutrition](#) [#skiing](#) [#science](#)



  7

1 Kommentar

A rolling stone gathers no moss – Now also scientifically proven!  
A sudden reduction or complete cessation of exercise results in an accelerated decline in oxygen saturation compared to the gradual, age-related decline in VO<sub>2</sub>max. This can negate many of the benefits of previous long-term exercise. Conversely, resumption of exercise has the potential to restore all or at least some of the lost VO<sub>2</sub>max.

<https://lnkd.in/eCbz9EGt>

#training #skiing #sports #science





We are currently preparing a report with ARD/SWR on ski jumping and landing on mats in winter. Yesterday, we tested on new mats from [Mr.Snow | Textile Snow](#) under winter conditions, i.e. cold and precipitation, at the MikroTribologie Centrum and achieved very good results. [Benjamin Wüst](#) is now making a film out of it, which will be shown before the FIS ski jumping in Wista. We will inform about the details. [#skijumping](#)



### Muscle soreness taped away

Mild muscle soreness in the lower back caused by several days of cross-country skiing training was reduced 24 hours after application of Kinesio tape. The method could allow a quicker return to physical activity. Therefore, athletes, coaches and physiotherapists can use this method before competitions to prevent muscle soreness or cramps.

<https://lnkd.in/exuDhRru>

[#skiing](#) [#science](#) [#training](#)



This morning on ARD: Mat jumping also in winter?  
Thanks to [Benjamin Wüst](#), [Mr.Snow | Textile Snow](#) and the Ski-Club Steinbach-Hallenberg e.V.!





**Benjamin Wüst** • 1.

Moderator und TV-Reporter ARD | SWR

6 Monate • Bearbeitet •

Skispringen ohne Schnee? Am Wochenende startet der Weltcup in Polen. Erstmals auf Matten. Wäre das nicht in Zeiten des Klimawandels und der Energiekrise generell eine sinnvolle Option, statt Millionen Euro für Kunstschnee auszugeben? Darüber berichten wir zum Weltcup-Auftakt in Wisla in der ARD am Wochenende. Im ARD-Mittagsmagazin gab es schon mal einen Vorgeschmack 🍷

[#klimakrise](#) [#energiesparen](#) [#skijumping](#)



Skitesting: A new project with [movX GmbH](https://lnkd.in/esjbkGni)  
<https://lnkd.in/esjbkGni>

[#skiing](#) [#testing](#)




**Wissenschaft: Gleittests für alle - xc-ski.de Langlauf**

xc-ski.de • Lesedauer: 2 Min.

3 Millionen Zuschauer wissen jetzt was Tribologie ist  
Heute konnten wir mit einem tribologischen Thema mehr als 3 Millionen  
Zuschauer erreichen! In der ARD wurde das Thema Matte ... mehr anzeigen

21:28 Sa., 5. Nov. 72%

Suche Start Ihr Netzwerk Jobs Nachrichten Mitteilungen Sie Mehr Premium gratis testen



**Prof. Dr. Matthias Scherge**  
Team Snowstorm: Gliding on Snow, Ice and Water  
Vollständiges Profil


**Prof. Dr. Matthias Scherge** · Sie  
Team Snowstorm: Gliding on Snow, Ice and Water  
4 Tage · 0

Today a longer clip on ARD.

**Benjamin Wüst** · 1.  
4 Tage · Bearbeitet · 0

Skispringen ohne Schnee? Am Wochenende startet der Weltcup in Polen. Erstmals auf Matten. Wäre das nicht in Zeiten des Klimawandels und der Energiekrise generell eine sinnvolle Option, statt Millionen Euro für Kunstschnee auszugeben? Darüber berichten wir zum Weltcup-Auftakt in Wisla in der ARD am Wochenende. Im ARD-Mittagsmagazin gab es schon mal einen Vorgeschmack 🍷

#klimakrise #energiesparen #skijumping

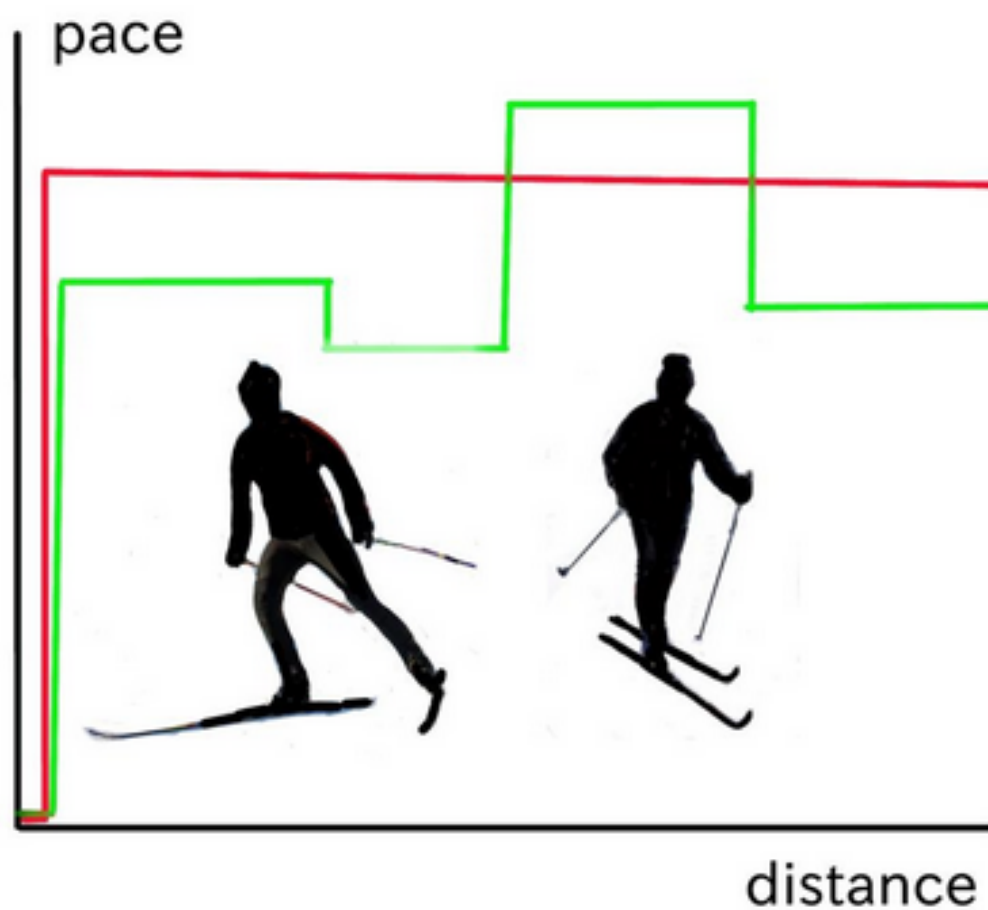


Sportschau: Ist Skispringen auf Matten eine Option für die Zukunft? | ...  
ardmediathek.de

The pace makes it

The number of cross-country masters athletes is steadily increasing. Therefore, the results of this study are of great practical importance for skiers and coaches. It is important to adapt the pace to the specific requirements of each XC masters skier. Very well trained athletes are advised to use a similar pacing strategy as the younger ones. For less trained skiers, on the other hand, a more even pace is recommended. For the preparation of long competitions, such as the Vasaloppet, a relatively even pace should be struck in training, both for slower and faster skiers compared to their younger counterparts.

<https://lnkd.in/eeY33sWR>  
#training #skiing



The latest GLIDING article.



**Wissenschaft: Schnell trotz Fluor - xc-ski.de Langlauf**

xc-ski.de • Lesedauer: 2 Min.



## Marit Bjørgen in numbers

During the 5 most successful years of competition, data from the daily training diary, interviews and physiological tests were evaluated. The training data were sorted by Training type (endurance, strength, and speed), intensity [low (LIT), moderate (MIT), and high-intensity training (HIT)], and type of training (running, cycling, and skiing/roller skiing). systematized. The study demonstrates the importance of a high volume of training with a polarized training pattern with a high proportion of LIT. A total of 937 hours distributed over 543 workouts were completed. Of these, 90.6% reserved for endurance, 8.0% for strength, and 1.4% for speed training. Endurance training was divided into 92.3% LIT, 2.9 MIT, and 4.8% HIT. Total LIT time was composed of 21% for warm-up training, 14% for training sessions <90 minutes, and 65% for long-distance training >90 minutes.

<https://lnkd.in/eBM9SRHy>

#science #training #skiing

