

8TH INTERNATIONAL CONGRESS ON SCIENCE AND SKIING



March 11–15, 2019
Vuokatti, Finland

PROGRAMME

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DAY 1 - Monday 11th of March

- 12:00 - REGISTRATION
- 15:00 **Vesa Linnamo & Stefan Lindinger**; Opening of the Congress
- 15:10 **Vesa Linnamo**; Emeritus prof. Paavo Komi Memorial lecture
- 15:30 **KEYNOTE** **Erich Müller**; Science in skiing (ICSS): past – present - future

Session 1: Young Investigator Award (YIA) competition

Chair **David Bacharach**

- 16:00 **Julian Fritz**; Knee joint loading during loaded squat jump landing (YIA)
- 16:15 **Veronica Bessone**; Torso and hip flexions influence ski jump landing impact (YIA)
- 16:30 **Matthew Cross**; Magnitude and relationship between force output and performance in giant slalom (YIA)
- 16:45 **Clément Delhaye**; Kinetic and kinematic turn switch detection in giant slalom (YIA)
- 17:00 COFFEE AND TECHNICAL EXHIBITION**
- 17:45 **Roman Bachmann**; Automatic 3D motion capture in Alpine skiing using deep learning and computer vision (YIA)
- 18:00 **Aaron Martinez**; Development of an automatic alpine skiing turn detection algorithm based on a simple sensor setup (YIA)
- 18:15 **Jingjing Xue**; A comparison of physiological variables between Chinese national cross-country skiers and long distance runners (YIA)
- 18:30 **Christina Mishica**; Heart rate variability in young athletes: when should we measure it and does it relate to performance? (YIA)
- 18:45 **Valeria Rosso**; Measures of impairment in cross-country sit skiing (YIA)
- 19:00 **Christian Weich**; The attractor method – a novel tool to highlight subtle differences in cross-country ski skating techniques (V1 vs. V2) (YIA)
- 19:30 GET TOGETHER EVENING (with finger food) AND TECHNICAL EXHIBITION (Congress venue)**

DAY 2 - Tuesday 12th of March

Session 2: Biomechanics in Alpine Skiing

Chairs **Erich Müller and Josef Kröll**

- 09:00 **KEYNOTE** **David Bacharach**; Bridging the gap between science and practice in winter sports
- 09:30 **INVITED** **Josef Kröll**; Application of power-force-velocity profiling to "ICSS" disciplines
- 9:50 **John Seifert**; Muscular responses to ski width when skiing on groomed and powder snow conditions
- 10:05 **Lynn Ellenberger**; Biomechanical analysis of jump landings in competitive alpine skiers: cross-sectional observations from youth to elite level
- 10:20 **ARCHINISIS** - company presentation
- 10:30 **COFFEE AND TECHNICAL EXHIBITION**
- 11:10 **Carlo Denier**; Skicross-starting facility: indoor vs. snow starts
- 11:25 **Marie Javet**; Performance of the pole-push during starts in Alpine skiing
- 11:40 **Renzo Pozzo**; Biomechanical efficiency of different starting techniques in ski cross
- 11:55 **Matthias Olvermann**; Analysis of the first acceleration phase of the female downhill world cup in Garmisch-Partenkirchen 2018
- 12:10 **1080 MOTION** - company presentation
- 12:20 **LUNCH**
- 14:00 **1080 MOTION** - company demonstration (outside)

Session 3: Physiology and Training in Cross-Country Skiing & Biathlon

Chairs **Marko Laaksonen and Øyvind Sandbakk**

- 14:30 **KEYNOTE** **Øyvind Sandbakk**; Modern training concepts in cross-country skiing
- 15:00 **INVITED** **Marko Laaksonen**; Biathlon - has the sport changed during the past decades and can science keep up?
- 15:20 **INVITED** **Ilkka Heinonen**; Limiting cardiovascular factors of cross-country skiing performance
- 15:40 **Stephanie Moore**; Influence of torso movement deviation on metabolic economy during V1 and V2 skate techniques
- 15:55 **Elias Bucher**; Analysis of the U23 cross-country Ski World Championship 2018 Sprint: Relative terrain performances and sex differences
- 16:10 **Jan Kocbach**; Sex-based differences in speed and sub-technique selection during an international competition in classical XC skiing
- 16:25 **Guro Solli**; Block versus traditional periodization of HIT: A comparison of two roads leading to Rome for the world's most successful cross-country skier
- 16:40 **Pietu Korhonen**; Effects of maximal upper-body strength training on double poling technique on young female skiers

16:55

YIA AWARDS

17:10

COFFEE, POSTERS AND TECHNICAL EXHIBITION

Session 4: Posters

Chairs **Thomas Stöggli** and **Stefan Lindinger**

17:10 – 18:30

Topic: Nordic Skiing

Renzo Pozzo; Biomechanical efficiency in elite athletes of sprint roller ski

Mats Ainegren; Effects of drafting on VO₂ in double poling XC-skiing

Ronny Fudel; Same but different. Are there differences in technique among training and competition in youth cross-country skiing?

Julia Baumgart; Development of a framework for investigating performance, physical and technical demands in para cross-country sit skiing: a case study

Miika Köykkä; Aiming accuracy in biathlon standing shooting performance

Topi Kiljunen; Comparison of gliding and grip properties of different types classical cross-country skis

Topic: Alpine Skiing

Hiroshi Hoshino; The power profile of the maximum anaerobic power of Alpine skiers

Kamil Povraznik; Long-term monitoring of power capabilities of pre puberty age sportsmen in Alpine skiing

Vjekoslav Cigrovski; Balance and recreational Alpine skiing are in a causative relationship

Carlo Denier; Alpine skiing starts on snow versus on matt plants

Arrigo Canclini; 3D kinematic analysis of diagonal stride in elite ski mountaineering (skialp) during world cup races

Topic: Technology

Frithjof Doerks; Accuracy and practicability of a magnet and magnetometer based split-time system in cross-country and Alpine skiing

Teemu Lemmettylä; Ski tester development for cross-country ski testing

Uwe Kersting; A feedback system to train start performance in ski cross

Vjekoslav Cigrovski; How can Xsens kinematic suit add to our understanding of a slalom turn: a case study in laboratory and field conditions

Masanori Yoshikawa; A study for quantification of Alpine skiing technique related to faster skiing using sensor systems

Esa Tuulari; Integrated sensor system for measuring and analyzing pole work in XC skiing

Cory Snyder; Validation of a simple sensor and algorithm system to calculate edging angle during Alpine skiing

Yu Liu; The effect of transcranial direct current stimulation on improving CMJ performance

Angelica Lunina; Target modeling in sport training of highly skilled cross-country skiers

FREE EVENING

DAY 3 - Wednesday 13th of March

Session 5: Talent and Injury in Skiing

Chairs **Christian Raschner and Maarit Valtonen**

- 09:00 **KEYNOTE** **Maarit Valtonen;** Preventive medicine in endurance winter sports
- 09:30 **Patricia Doyle-Baker;** The base study results in U14 Canadian Alpine ski-racers
- 09:45 **Rick Howell;** Scaling lateral heel release across a range of anthropometrics to associate with ACL-friendly Alpine skiing
- 10:00 **Lisa Steidl-Müller;** Training load characteristics and injury and illness risk identification in elite youth ski racing: A prospective study
- 10:15 **Jörg Spörri;** Injury-related health problems and illnesses in youth Alpine skiers: a 6 month prospective cohort study of 167 athletes
- 10:30 **Andreas Huber;** Single leg jumps as resource to improve injury prevention and the return-to-competition process
- 10:45 **COFFEE AND TECHNICAL EXHIBITION**

Session 6: Paralympic Skiing

Chairs **Vesa Linnamo and Laura Gastaldi**

- 11:45 **INVITED** **Kaspar Wirz;** A cross-country skiing coach perspective on 40 years practical work using scientific input – challenge and chance
- 11:55 **INVITED** **Laura Gastaldi & Magdalena Karczewska-Lindinger;** Race and split time analysis in Para Nordic sit-skiing
- 12:15 **INVITED** **Maren Goll;** Paralympic Alpine skiing – applying approaches from motorsports to the sport of sit-skiing
- 12:35 **Matthias Scherge;** Determination of factors influencing the effectiveness of propulsion of Paralympic sitskis
- 12:50 **LUNCH**

Session 7: Free afternoon - skiing

DAY 4 - Thursday 14th of March

Session 8: Cross-Country Skiing

Chairs **Barbara Pellegrini and Walter Herzog**

- 09:00 **KEYNOTE** **Walter Herzog**; Cross-country skiing as a model for human movement analysis
- 09:30 **INVITED** **Barbara Pellegrini**; Relationships between cross-country skiing economy and athletes' skills
- 09:50 **INVITED** **Thomas Stöggl**; Altered demands in cross-country skiing
- 10:10 **Jørgen Danielsen**; Source of power generation during double poling at shallow and steep inclines
- 10:25 **Olli Ohtonen**; Effects of fatigue on propulsive forces during ski skating
- 10:40 **Petri Ollonen**; A biomechanical analysis of a cross-country skiing World Cup competition at Ruka, Finland 2015
- 10:55** **COFFEE AND TECHNICAL EXHIBITION**
- 11:30 **Arrigo Canclini**; Historical analysis of double poling in high-level XC skiing
- 11:45 **Dan Kuypenstierna**; Validation, accuracy and practical use of a miniature force and IMU based power measurement system for analyses of cross-country training and racing – a pilot study
- 12:00 **Florian Paternoster**; Biomechanical analysis of G3 skating technique on a treadmill of world-class and national-elite female biathletes
- 12:15 **Chiara Zoppiroli**; Kinematic alterations of double poling cycle in groups of skiers with different performance levels during a long-distance race
- 12:30 **Melissa Masters**; Ketogenic diets for endurance athletes: weighing the pros and cons
- 12:45 **GAIT UP** - company presentation
- 12:55** **LUNCH**

Session 9: Ski Jumping

Chairs **Mikko Virmavirta and Gertjan Ettema**

- 14:30 **INVITED** **Mikko Virmavirta**; Do ski jumpers still need to be light?
- 14:50 **Gertjan Ettema**; Dynamics of ski jump take-off skill
- 15:05 **SIMI REALITY MOTION SYSTEMS GMBH** – company presentation

Session 10: Air drag and Aerodynamics in Skiing

Chairs **Stefan Lindinger and Mats Ainegren**

- 15:25 **INVITED** **Stefan Lindinger**; Air drag and aerodynamics in skiing
- 15:45 **Mats Ainegren**; A climatic wind tunnel for physiological sports experimentation
- 16:00 **Clemens Früwirth**; Frontal area detection during sportive motion with the use of a 3D camera

- 16:15 **Ola Elfmak**; The effect of athlete body positioning on aerodynamic drag and performance in Alpine ski racing
- 16:30 **Proskida** – company presentation
- 16:50 **COFFEE AND TECHNICAL EXHIBITION**

Session 11: Laboratory Demonstrations

- 17:30 – 18:45 Laboratory demonstrations (Snowpolis building)
- 20:00 **CONGRESS DINNER (Vuokatti Sport Restaurant)**

DAY 5 - Friday 15th of March

Session 12: Methodology and Technology in Skiing

Chairs **Thomas Stöggl and Masaki Takeda**

- 09:00 **INVITED** **Masaki Takeda**; Classical cross-country technique detection by high precision kinematic global navigation satellite system
- 09:20 **Naoto Miyamoto**; Validation of wearable kinematic GNSS receiver for cross-country skiing
- 09:35 **Anil Kodiyan**; Cross country technique and sub-technique classification using a single inertial sensor placed on the ski
- 9:50 **Uwe Kersting**; Feasibility of a method to assess joint loading in snowboard landings
- 10:05 **Ronald Kipp**; Ski characteristics from different width skis while powder skiing
- 10:20 **Cory Snyder**; Ski style classification and scoring in Alpine skiing using a simple sensor and algorithm system

Session 13: Coaching & Science

Chairs **Stefan Lindinger and David Bacharach**

- 10:40 **PODIUM DISCUSSION** “COACHING now and in 2050?”

Session 14: Closing ceremony

- 11:20 **Stefan Lindinger**; ICSS VISIONS
- 11:40 – 12:00 **Vesa Linnamo**; CLOSING of the ICSS2019

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