



10TH INTERNATIONAL CONGRESS ON SCIENCE AND SKIING

January 28 February 1, 2025

Val di Fiemme, Italy

Draft Version

(7 Jan 2025)

Subject to Slight Changes

PROGRAMME

| Day 1 - Jan 28 Tue Tesero Teatro | | Day 2 - Jan 29 Wed Cavalese Palafiemme | | Day 3 - Jan 30 Thu Cavalese Palafiemme | | Day 4 - Jan 31 Fri Cavalese Palafiemme | | Day 5 - Feb 1 Sat Cavalese Palafiemme | | |
|-------------------------------------|---|--|--|--|--|---|--|--|---|--|
| | | 8:45 | Keynote Kirsty Elliot-Sale (UK) | 8:30 | Social activity: Alpine skiing in Pampeago/Latemar | 8:30 | Social activity: Alpine skiing in Cermis | 8:30 | Invited: Andreas Almquist (SWE) | |
| | | 9:30 | Invited: Thomas Stoeckl (AUT) | | | 9:00 | | Oral session: Analysis and Optimization of Ski- Snow Interactions | Oral session: Equipment in Ski Mountaineering | |
| | | 10:00 | Oral session: Testing Technologies and Methodologies | | | 10:30 | | Coffee Break | | |
| | | 10:45 | Coffee Break | | | 11:00 | | Keynote Jörg Spörri (SWI) | | |
| | | 11:15 | Oral session: Testing Technologies and Methodologies Company: Skisens | | | 11:45 | | Oral session: Biomechanics in Alpine Skiing | | |
| 12:30 | Registration | 12:30 | Lunch | | | | | 12:45 | YIA - closing ceremony | |
| | | 13:30 | Invited: Chiara Zoppirolli (ITA) | | | | | 13:15 | Farewell Lunch | |
| 14:00 | | Invited : Patricia Doyle-Baker (CAN) | 14:00 | Oral session: Performance and Technique Analysis in Biathlon | (lunch not covered by ICSS) | | (lunch not covered by ICSS) | | | |
| 14:30 | | Oral session: Physiological, Biomechanical and Technical Factors of Performance Company: Qualisys | 15:15 | Institution: IBU Academy | 14:45 | Invited: Matthias Gilgien (NOR) | 14:45 | Invited: Matej Supej (SLO) | | |
| 15:30 | | Coffee Break | 16:15 | Poster session 3 min presentation from the podium | 15:15 | Oral session: Injury Prevention and Risk Management in Skiing | 15:15 | Oral session: Biomechanics in Olympic and Paralympic Nordic Skiing | | |
| 16:15 | Invited: Guro Strøm Solli (NOR) | 16:15 | Coffee Break | 16:15 | Coffee Break | 16:15 | Oral session: Biomechanics in Alpine Skiing | | | |
| 16:45 | Oral session: Physiological, Biomechanical and Technical Factors of Performance | 16:45 | Honor speech: Erich Müller (AUT) ICSS 1996 – 2025 | 16:45 | Keynote Øyvind Sandbakk (NOR) | 16:30 | Company: SIMI Coffee Break | | | |
| 17:45 | Special session | 17:45 | Invited: Gregoire Millet (SWI) | 17:30 | Company | 17:00 | Keynote Marco Narici (ITA) | | | |
| 18:30 | Opening Ceremony | 16:15 | Oral session: Testing Technologies and Methodologies | | Oral session: Biomechanics in ski Mountaineering | 17:45 | Oral session: Advances in Ski Materials and Design | | | |
| 19:00 | Welcome Party | | Oral session: Physiological Insights in Skiing Disciplines | | Oral session: Coaching and Skill Development | | Oral session: Perspectives on Health, well being and Leisure in Skiing | | | |
| 19:30 | | | | 20:00 | Gala Dinner | | | | | |

Teathre - (Tesero)

(Shuttle Bus from Palafiemme Cavalese)

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| Invited speech | | Tue 28 th Jan |
| Chair: Guro Strøm Solli (NOR) | | Chair Nat. |
| 14:00 | Canadian Female performance in alpine ski racing: how they "train to train". <i>Patricia Doyle-Baker</i> | CAN |
| Oral session: Performance Factors: Physiological, Biomechanical, Technical - part 1 | | Tue 28 th Jan |
| Chair: Guro Strøm Solli (NOR) | | Chair Nat. |
| 14:30 | Different approaches to analyze start strategies of world cup racers in alpine ski racing <i>Peter Spitzenpfeil</i> | Germany |
| 14:45 | Physiological demands and performance predictors of Olympic ski-mountaineering <i>Alessandro Fornasiero</i> | Italy |
| 15:00 | Estimating race time differences from technical boosting in para nordic sit-skiing with simulations <i>Julius Lidar</i> | Sweden |
| 15:15 | Company: Qualysis | |

Teathre - (Tesero)

(Shuttle Bus from Palafiemme Cavalese)

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| Invited speech | | Tue 28 th Jan |
| Chair: Patricia Doyle-Baker | | Canada |
| 16:15 | The Female Skier: Current Insights and Future Directions | |
| | <i>Guro Strøm Solli</i> | Norway |
| Oral session: Performance Factors: Physiological, Biomechanical, Technical - part 2 | | Tue 28 th Jan |
| Chair: Patricia Doyle-Baker | | Canada |
| 16:45 | Analysis of exercise intensity distribution and shooting performance in a summer biathlon sprint race | |
| YIA | <i>Martina Palumbo</i> | Italy |
| 17:00 | Biological maturity and performance in youth alpine | |
| YIA | <i>Giulia Pellizzati</i> | Italy |
| 17:15 | Physical fitness factors for roller skiing race performance | |
| YIA | <i>Shunya Uda</i> | Japan |
| 18:15 | OPENING CERIMONY | |
| | | Tue 28 th Jan |
| 19:00 | WELCOME PARTY | |
| | | Tue 28 th Jan |

Hall "Cermis"

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| Keynote | Wed 29 th Jan |
| Chair: Patricia Doyle-Baker | Canada |
| 08:45 | Ovarian hormones: Friend or foe of female Olympians? |
| <i>Kirsty Elliot-Sale</i> | United Kingdom |

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| Invited speech | Wed 29 th Jan |
| Chair: Hans-Christer Holmberg | Sweden |
| 09:30 | Trends, perspectives, opportunities and challenges with sensor technology in wintersports |
| <i>Thomas Stöggl</i> | Austria |
| Oral session: Testing: Technologies and Methodologies - part 1 | Wed 29 th Jan |
| Chair: Thomas Stöggl | Austria |
| 10:00 | Multi-camera framing of dry slope snowboarding jumps |
| YIA | <i>Robbe Decorte</i> Belgium |
| 10:15 | Reproducibility of cortical somatosensory evoked potentials in cross-country skiing: a proof-of-concept study |
| <i>Harri Piitulainen</i> | Finland |

Room "Cermis"

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| Oral session: Testing: Technologies and Methodologies - part 2 | | Wed 29 th Jan |
| Chair: Thomas Stöggl | | Austria |
| 11:15 | Near-infrared-spectroscopy derived vs lactate thresholds in elite Nordic skiers | |
| YIA | <i>Jonas Forot</i> | France |
| 11:30 | Electromyographic thresholds are expressed in the double-poling in cross-country skiers | |
| | <i>Masaki Takeda</i> | Japan |
| 11:45 | Whole-body vibration transmission during resistance vibration exercise and artificial gravity: a “ski simulator” as a potential exercise device for the mission to Mars | |
| YIA | <i>Riccardo Sorrentino</i> | Slovenija |
| 12:00 | A comparison of the reliability of force-velocity profiling methods using linear position transducers in winter sports | |
| | <i>Cory James Synder</i> | Austria |
| 12:15 | Company: Skisens | |

Room "Cermis"

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| Invited speech | | Wed 29 th Jan |
| Chair: Barbara Pellegrini | | Italy |
| 13:30 | Laboratory and field testing integration for a better understanding of biathlon performance <i>Chiara Zoppirolli</i> | Italy |
| Oral session: Performance and Technique Analysis in Biathlon | | Wed 29 th Jan |
| Chair: Chiara Zoppirolli | | Italy |
| 14:00 | A static hold test can assess stability of hold and postural control for biathlon prone shooting | |
| YIA | <i>Miika Kōykkä</i> | Finland |
| 14:15 | Physiologic effects of changing rifle carry position in elite biathletes | |
| YIA | <i>Ethan Livingood</i> | USA |
| 14:30 | Visual requirements and shooting performance of the elite biathlete <i>Vesa Linnamo</i> | Finland |
| 14:45 | Roller ski interval training in biathletes: assessing whether athletes meet high-intensity targets on the track <i>Simone Bettiga</i> | Italy |
| 15:00 | IBU Academy: Advancing Biathlon through Education, Research, and Dual-Career Development <i>Gerold Sattlecker</i> | Austria |

Room "Cermis"

| Poster session | | | Wed 29 th Jan |
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| Char: Patricia Doyle-Baker (CAN) | | | 15:15 - 16:15 |
| | Multi-segment skier model for simulating falls at high speed | <i>Piotr Aschenbrenner</i> | Poland |
| | Movement frequency and performance level during alpine skiing and testing exercises in young skiers | <i>Andrea Besseghini</i> | Italy |
| | Differences in kinematic parameters of alpine skiing turns between skiers of different skill levels | <i>Ivan Bon</i> | Croatia |
| | Smart competitions in alpine skiing – a pilot study | <i>Björn Bruhin</i> | Switzerland |
| | Influence of special life circumstances on the risk of injury in alpine skiing - a study of athletes on the German ski association's development-team | <i>Maren Goll</i> | Germany |
| | Modifications to the nanoindentation test platform for measuring the mechanical properties of ice and compacted snow | <i>Karlis Agris Gross</i> | Latvia |
| YIA | Ski wax distribution at the surface of cross-country skis | <i>Pauline Lefebvre</i> | France |
| | A new electronic rifle range and shooting laboratory for biathlon training and research | <i>Antti Leppävuori</i> | Finland |
| | Choosing ski length: how mechanical properties evolve across length and width | <i>Alexis Lussier Desbiens</i> | Canada |
| | Technique analysis of a 50-km cross-country ski marathon race using high-precision kinematic GNSS | <i>Masaki Takeda</i> | Japan |
| | Characterizing Propulsion Pole Forces in Ski Mountaineering on Snow | <i>Beatrice Todesco</i> | Italy |
| | A supervised machine learning approach for Technique Identification in Cross-Country Skiing Using Pole-Embedded IMU Sensors | <i>Gianluca Viscioni</i> | Italy |

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| | Diagnostics of strength abilities of paralympic athletes | <i>Kamil Povraznik</i> | Slovakia |
| YIA | Sex differences in elite ski mountaineering aerobic performance | <i>Forrest Schorderet</i> | Switzerland |
| YIA | The effect of course design on the number of rank shifts in skicross world cup for women and men | <i>Linda Tomelleri</i> | Norway |
| YIA | Acute fatigue effects of two different plyometric jumps on landing ground reaction force, time to stabilization, jump height and inter-limb functional asymmetry | <i>Nicola Trotta</i> | Italia |
| YIA | Physiological responses to heat stress during summer jump training in snowboarders | <i>Risa Iwata</i> | Japan |
| | The process of psychological training for the alpine skiing instructors - the role of the coach developer | <i>Marcin Krawczyński</i> | Poland |
| | About the concept and effects of alpine skiing as a sport therapy project with childhood cancer survivors | <i>Nicolas Kurpiers</i> | Germany |
| | Better estimation of skills level in recreational skiing: development and validation of a practical multidimensional instrument | <i>Floriana Samantha Luppino</i> | The Netherlands |
| | From ski mountaineering to unraveling DOMS mechanisms | <i>Lorenzo Visconti</i> | Belgium |
| | Avoiding mode-monotony: how world-class cross-country skiers use exercise mode variations to manage daily load | <i>Jacob Walther</i> | Germany |
| | Metabolic responses in the annual training cycle of highly trained cross-country skiers | <i>Alexandra Lyudinina</i> | Russia |

Room "Cermis"

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| Honor speech | | Wed 29 th Jan |
| Chair: Dave Bacharach | | USA |
| 16:45 | ICSS 1996 – 2025: Science in skiing, past – present – future! | |
| | <i>Erich Müller</i> | |
| Invited speech | | Wed 29 th Jan |
| Chair: Federico Schena | | Italy |
| 17:30 | Do women have to train differently in altitude ? | |
| | <i>Gregoire Millet</i> | Switzerland |

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| Oral session: Physiological Insights in Skiing Disciplines | | Wed 29 th Jan |
| Chair: Gregoire Millet | | France |
| 18:00 | Beyond the classical “living high” paradigm in winter sports: lessons from summer sports | |
| | <i>Franck Brocherie</i> | France |
| 18:15 | Spinal and supraspinal excitability during cross-country skiing using V2 skating technique | |
| | <i>Magdalena Karczewska-Lindinger</i> | Italy |
| 18:30 | Longitudinal analysis of aerobic performance indicators in elite cross-country skiers: age- and sex-dependent trajectories across the career | |
| | <i>Elias Bucher</i> | Switzerland |
| 18:45 | Higher energy availability may support hemoglobin mass adaptation during a 21-day period at normobaric hypoxia and normoxia in female skiers | |
| YIA | <i>Oona Kettunen</i> | Finland |

Room "Latemar"

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|---|--|--------------------------|
| Oral session: Testing: Technologies and Methodologies - part 3 | | Wed 29 th Jan |
| Chair: Matej Supej | | Italy |
| 18:00 | AI-racer: an immersive AI-enabled VR-tool for alpine ski racing | |
| | <i>Martin J. Bünner</i> | Switzerland |
| 18:15 | Objectification of the results of the agility-test through the use of AI methods | |
| | <i>Andreas Huber</i> | Germany |
| 18:30 | Trajectory filtering and jump modelling in ski cross VR-application | |
| YIA | <i>Samuel Schwyn</i> | Switzerland |

Room "Cermis"

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|---|---|--------------------------|
| Invited speech | | Thu 30 th Jan |
| Chair: Nicola Petrone | | Italy |
| 15:00 | The effect of course design on surrogate measures of injury risk in women and men world cup skicross <i>Matthias Gilgien</i> | Norway |
| Oral session: Injury Prevention and Risk Management in Skiing | | Thu 30 th Jan |
| Chair: Dave Bacharaach | | USA |
| 15:30 | Ski binding performance, biomechanics, testing, and engineering design <i>Christopher Brown</i> | USA |
| 15:45 | Validation of a biofidelic sensorized knee for ski fall simulations in a dynamic multiaxial test bench <i>Nicola Petrone</i> | Italy |
| 16:00 | Managing the malaligned skier on and off hill <i>Carl Petersen</i> | Canada |

Room "Latemar"

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| Oral session: Biomechanics in Olympic and Paralympic Nordic Skiing | | Thu 30 th Jan |
| Chair: Barbara Pellegrini | | Italy |
| 15:00 | 3D kinematic and mechanical energy in freestyle cross country skiing (XCS) during sprint world cup races <i>Arrigo Canclini</i> | Italy |
| 15:15 | Influence of pole length on metabolic and kinematic outcomes in cross country sit skiers YIA <i>Sage Blickensderfer</i> | USA |
| 15:30 | The effect of sitting position on sit-ski performance on a treadmill and in a ski ergometer - cycle characteristics and physiological parameters: a case study YIA <i>Ville Sampolahti</i> | Finland |
| 15:45 | A study of takeoff motion in ski jumping using principal component analysis and computational fluid dynamics YIA <i>Shin Ikeda</i> | Japan |
| 16:00 | Technique adaptation at varying friction in cross-country ski skating YIA <i>Gustav Hindér</i> | Sweden |

Room "Cermis"

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| Keynote | Thu 30 th Jan |
| Chair: Thomas Stöggli | Austria |
| 16:45 | The Development Process of Bringing Junior Talents to the World-Class Stage in XC Skiing <i>Øyvind Sandbakk</i> Norway |

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| Oral session: Coaching and Skill Development | Thu 30 th Jan |
| Chair: Øyvind Sandbakk | Norway |
| 17:45 | Coaching snowboard tricks: do biomechanical data align with expert insights? <i>Lina Fay</i> Germany |
| 18:00 | Freeskiers' self-organized and unique pathways to world-class performance in big air <i>Espen Berg-Johnsen</i> Norway |
| 18:15 | Development of the performance structure model in snowboard slopestyle and big air <i>Hiroki Ozaki</i> Japan |
| 18:30 | Perceptions of mental skill development in youth snow sports athletes: a qualitative interview study <i>Philippe O Müller</i> Switzerland |

Room "Latemar"

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| Oral session: Biomechanics in Ski Mountaineering | Thu 30 th Jan |
| Chair: Lorenzo Bortolan | Italy |
| 17:45 | Mechanical energy and kinematics of diagonal stride technique in world cup ski mountaineering races <i>Renzo Pozzo</i> Italy |
| 18:00 | Advancing Ski Mountaineering Gait Analysis: Measuring Step Frequency and Contact Time on a Treadmill with Accelerometers <i>Matej Majerič</i> Slovenia |
| 18:15 | Comparative kinematic analysis of ski-mountaineering boots reveals performance-influencing joint mechanics YIA <i>Michele Mattivi</i> Italy |
| 18:30 | Short or Long? Analyzing the Impact of Ski Pole Length on Elite Ski Mountaineers' Efficiency YIA <i>Nina Verdel</i> Slovenia |

Room "Cermis"

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| Invited | | Fri 31 st Jan |
| Chair: Veit Senner | | Germany |
| 14:45 | Evolution of Biomechanical Measurement in Alpine Skiing: The Outdoor Laboratory Beyond Milan Cortina 2026 <i>Matej Supej</i> | Slovenia |

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| Oral session: Biomechanics in Alpine Skiing | | Fri 31 st Jan |
| Chair: Veit Senner | | Germany |
| 15:15 YIA | 3D ski boot deformation from distributed IMUs <i>Samuel Dallain</i> | Canada |
| 15:30 YIA | Reliability of systems for skier biomechanics analysis: from lab testing to on-slope performance <i>Giorgia Celeste Cuniberti</i> | Italy |
| 15:45 YIA | Beyond the carving-skidding dichotomy: sensor-assisted measurement of angle of attack in skiing <i>Christoph Thorwrtl</i> | Austria |
| 16:00 YIA | Edge angle estimation using IMUs – an in-field validation approach using AI pose estimation <i>Chris Hummel</i> | Germany |
| 16:15 | New Developments in Optical Motion Capture for Winter Sports <i>Company presentation: SIMI - Thomas Hock</i> | Germany |

Room "Cermis"

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| Keynote | Fri 31 st Jan |
| Chair: Federico Schena, Vesa Linnamo | Italy, Finland |
| 17:00 | |
| <i>Marco Narici</i> | Italy |

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| Oral session: Advances in Ski Materials and Design | Fri 31 st Jan |
| Chair: Nicola Petrone | Italy |
| 17:45 | Vibration-optimized design to improve safety-related performance |
| | <i>Veit Senner</i> Germany |
| 18:00 | Complete recycling of skiing by selective dissolution in bio-based solvents with a fully circular approach |
| | <i>Martino Colonna</i> Italy |
| 18:15 | Ski profile characterization using different methods |
| | <i>Joakim Sandberg</i> Sweden |
| 18:30 | Alpine skis categorization and on-snow performance prediction from mechanical measurements |
| | <i>Alexis Lussier Desbiens</i> Canada |
| 18:45 | Advanced materials in ski design |
| YIA | <i>Alberto Sancho</i> Spain |

Room "Latemar"

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| Oral session: Perspectives on Health, well being and Leisure in Skiing | Fri 31 st Jan |
| Chair: John Seifert | USA |
| 17:45 | Mental health benefits of a one-week, ski-based exercise intervention for primary brain tumor patients and their caregivers |
| | <i>Nora Hansel</i> Germany |
| 18:00 | A qualitative study on leisure involvement and well-being in skiing - insights from qualitative research on ski enthusiasts and instructors |
| YIA | <i>Taro Aihara</i> Japan |
| 18:15 | Current status of small ski areas in Hokkaido: management base and its usage |
| YIA | <i>Shumpei Kurosawa</i> Japan |
| 18:30 | Level of overestimation among Dutch recreational skiers: unskilled tourists in the mountains |
| | <i>Floriana Samantha Luppino</i> The Netherlands |

Room "Cermis"

| Invited | | Sat 1 st Feb |
|--------------------|---|-------------------------|
| Chair: Matej Supej | | Slovenia |
| 08:30 | Optimising ski performance: a multi-scale analysis of ski-snow friction in cold conditions <i>Andreas Almqvist</i> | Sweden |

| Oral session: Analysis of Ski-Snow Interactions | | Sat 1 st Feb |
|---|---|-------------------------|
| Chair: Andreas Almqvist | | Sweden |
| 09:00 | A portable instrument for rolling resistance characterization of roller ski wheels YIA <i>John Andréas (Adressed: Andréas) Löfgren</i> | Sweden |
| 09:15 | Inorganic sputtered coatings to win gold medals at winter olympics YIA <i>Pauline Lefebvre</i> | France |
| 09:30 | Rolling resistance coefficient of various roller-ski wheel types and manufacturers <i>Anna-Mia Brulin</i> | Sweden |
| 09:45 | Development and validation of a new standard for roller-ski wheel classification <i>Albert Hansson</i> | Sweden |
| 10:00 | Effect of crystallinity on wear properties of UHMWPE-ski base with varying molecular weights <i>Nazanin Emami</i> | Sweden |
| 10:15 | On the hydrodynamic lubrication of skiing <i>Roland Larsson</i> | Sweden |

Room "Latemar"

| Oral session: Equipment in Ski Mountaineering | | Sat 1 st Feb |
|---|---|-------------------------|
| Chair: Matej Supej | | Slovenia |
| 09:00 | Mechanical efficiency - pin vs. freeride bindings YIA <i>Tobin Oliver Arden</i> | USA |
| 09:15 | Does binding weight influence physiological response? a laboratory based study YIA <i>Sami Samuels</i> | USA |
| 09:30 | Kinematic differences in ski mountaineering bindings during treadmill skinning YIA <i>Isaac Burgess</i> | USA |
| 09:45 | Comparison of the flex index of ski touring boots obtained using three different testing methods YIA <i>Giuseppe Zullo</i> | Italy |
| 10:00 | Effect of ski touring binding design on load distribution between toe and heel pieces YIA <i>Lorenzo Crosetta</i> | Italy |
| 10:15 | The effect of different widths on ski touring engineering parameters and subjective evaluations YIA <i>Matteo Rinaldi</i> | Italy |

Room "Cermis"

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|-----------------------|--|-------------------------|
| Keynote | | Sat 1 st Feb |
| Chair: Dave Bacharach | | USA |
| 11:00 | Risk management in alpine ski racing – every piece of the puzzle counts! <i>Jörg Spörri</i> | Switzerland |

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| Oral session: Biomechanics in Alpine Skiing | | Sat 1 st Feb |
| Chair: Jörg Spörri | | Switzerland |
| 11:45 | The effect of increased gate offset in flat terrain on skier mechanics for male and female world cup alpine skiers YIA <i>Ivar Hereide Mannsåker</i> | Norway |
| 12:00 | Age-related skiing technique differences based on quantifiable movement components YIA <i>Daniel Debertin</i> | Austria |
| 12:15 | An EMG comparison of telemark and alpine ski turns <i>John Seifert</i> | USA |
| 12:30 | The influence of trunk impairment level on trunk movement during para-alpine sit-skiing <i>Yusuke Ishige</i> | Japan |
| Closing Ceremony | | Sat 1 st Feb |
| 12:45 | YIA Ceremony | |
| 13:00 | Closing Remarks | |