

OFFICIAL



SPORTS TECHNOLOGY & APPLIED RESEARCH SYMPOSIUM (STARS)

28th October – 1st November 2024



Date & Time (AEDT)	Theme	Presenter/s
DAY 1 – Monday 28th October		
1:30pm -2:30pm	2024 AIS Return to Play Grant Recipients	Franco Impellizzeri University of Technology Sydney Lari Trease La Trobe University Steve Swanson Deakin University Daniel Kadlec Edith Cowan University
DAY 2 -Tuesday 29th October		
1:30pm -2:30pm	Optimising heat acclimation across the National Institute Network	Julien Periard & Josh Elliott University of Canberra
DAY 3 – Wednesday 30th October		
1:30pm -2:30pm	Performance-centred practice: enhanced athlete characterisation will unlock individualised training and promote interdisciplinary engagement	Katie Slattery UTS & Jamie Stanley SASI
DAY 4 – Thursday 31st October		
1:30pm -2:30pm	Improving Statistical Literacy in Sport – Get up to SPEED!	Andrew Govus La Trobe University
DAY 5 – Friday 1st November		
9:00am -10:00am	Aussie Abroad - Q&A with Blake McLean, Associate Professor, School of Sport, Exercise & Rehabilitation, University of Technology Sydney and Director of Performance Research and Development, Oklahoma City Thunder	Blake McLean UTS & Oklahoma City Thunder
11:00am - 12:00pm	How does the fit of garments and equipment affect human performance?	Celeste Coltman University of Canberra
1:00pm - 2:00pm	Aerodynamic engineering for performance impact: Australian Centre for Sports Aerodynamics	John Pitman Australian Centre for Sports Aerodynamics
2:30pm – 3:30pm	How to increase mental activity and enhance mental recovery in athletic populations: learnings from and AFLW preseason	Suzy Russell & Carissa Gardiner Australian Catholic University

2024 AIS Return to Play Grant Recipients

Monday 28th October 1:30pm – 2:30pm

In 2024, the Australian Sports Commission announced funding for four new research projects aligned to the Successful Athlete priority of the National High Performance Sport Research Agenda. In this session, the four 2024 AIS Research and Development Grant Program recipients will present on their projects aimed at ensuring a safe and efficient return to play for athletes.

Predicting the Recovery of Elite Athletes from Low Back Pain



Presented by Dr Larissa Trease

Dr Lari Trease is a Canberra based, Specialist Sport and Exercise Physician with more than 15 years' experience in elite sport. Lari has been a team Doctor for Australian Summer (2016) and Winter (2014) Olympic, Paralympic (2008) and Youth Olympic (2012) Teams. She has had many roles within the Australian High Performance Sporting system, including providing leadership, medical care, and policy advice across three institutes of sport, and five National sporting organisations. She currently consults part-time at the Australian Institute of Sport, is the Team Doctor for the Australian Cross-Country Ski Team and a member of the World Rowing Sports Medicine Commission.

Larissa has a career-long interest in optimising medical care for elite athletes through research. She is a PhD Candidate at La Trobe Sport and Exercise Medicine Research Centre (LASEM), La Trobe University, where her research focuses on predicting the recovery of elite athletes from low back pain. She is a National Health and Medical Research Council (NHMRC) PhD scholarship recipient. Lari's research aims to assist clinicians, coaches and athletes in elite sport to better understand the recovery trajectory and important recovery factors in athletes with LBP.

Up to 90% of Olympic athletes experience low back pain (LBP) in their career. LBP disrupts training, crew or team selection, travel and competition. Clinicians working in sport make decisions on management and return to sport currently using clinical acumen. However, factors that influence the trajectory of LBP recovery in athletes and the most effective way to assess, predict and monitor recovery are not established. The aim of this research is to assist clinicians in the prediction of recovery from pain, return to sport decision making for training and performance. The research outcomes will benefit athletes, coaches, teams/crews and clinicians in high performance sport. This presentation will share with STARS attendees the study protocol, including novel recruitment methods in the AUS HP sport system and share preliminary results.



Quantifying Adaptability Within and Between Tasks as a Novel Measure for Return to Play Testing and Monitoring



Presented by Dr Daniel Kadlec

Dr Kadlec is an AIS Funded Research Fellow and Early Career Researcher at Edith Cowan University with a research background in knee injury risk, motor learning and statistical methodology. Daniel is the High-Performance Manager for Claremont WFC, is working at the Western Australian Institute of Sport and has 15 years of Strength & Conditioning experience across national, international and Olympic-level athletes

In this session, Dr Kadlec will address the gap in current return-to-play strategies, which focus on performance outcomes rather than the quality of movement execution. This presentation underscores the role of movement variability in reflecting the adaptability required for athletic performance. By leveraging the concept of 'optimal movement variability', it highlights the importance of maintaining a healthy range of variability to reduce injury risk, proposing new methodologies to better understand player health and performance.

Beyond Injury Recovery: Supporting Holistic Athlete Wellbeing During the Return to Play Journey – Dr Steve Swanson, Deakin University



Presented by Dr Steve Swanson

Steve Swanson is an Associate Professor in Sport Management and Co-Director of the Centre for Sport Research at Deakin University. His research focuses on leadership, well-being, and innovation in the sport environment. While leading multiple international projects, his research has been funded by prestigious organisations such as the Olympic Studies Centre and the British Academy. Prior to Deakin, Dr Swanson was the Director of Sport Business and Leadership at Loughborough University in London, and a successful basketball coach at the professional and intercollegiate levels.

This presentation will provide a broad overview of a study focusing on performance support staff facilitation of athlete wellbeing during the return to play process. Initial insights from coaches, physios, performance psychologists, and AW&E managers will be provided.



The RUDDER project
Return-to-Sport Using Decision Determinants to Evaluate Risk of Re-injury in Sport –
Professor Franco Impellizzeri, University of Technology Sydney



Presented by Professor Franco Impellizzeri

Franco Impellizzeri is a Professor in Sport and Exercise Science and Medicine at the University of Technology Sydney (UTS). Main research areas and interests are sport epidemiology, research methods, training and testing for high performance. Beyond sports, Impellizzeri has also 10 years of experience in orthopedic research (clinimetrics). He is a member of the editorial boards of various scientific journals and currently serves as the editor-in-chief of *Science and Medicine in Football* journal. He has > 200 publications in sports science and orthopedics and author of book chapters for textbooks. Impellizzeri is a fellow of the European College of Sport Sciences, member of the STORK (*The Society for Transparency, Openness, and Replication in Kinesiology*), and member of the managing board of the Peer Community in (PCI) Health & Movement Sciences. Impellizzeri has collaborated with professional clubs and international sports organizations as a scientific advisor and project leader. His practical experience also includes working as a strength and conditioning coach for Olympic athletes.

Shared decision-making is a recommended collaborative process involving both clinicians and patients. In the context of return-to-sport, this process involves a broader range of stakeholders, such as doctors, physiotherapists, athletes, coaches, and management. The involvement of multiple stakeholders increases the risk of disagreement and conflicts possibly leading to a loss of trust, litigation, and ultimately even harm to athletes' health.

The project (observational prospective research design) will try to answer the following research questions: 1) What is the accuracy of the reinjury risk estimation among stakeholders, 2) What is the variability among stakeholders with regards to perception of reinjury risk and factors influencing return-to-sport decision, and 3) What is the occupation possessing the best ability to evaluate these criteria?

The results will allow to understand whether discrepancies are due to lack of training (solvable through education), scientific knowledge (solvable through research) or "simply" reflect divergence in personal/societal values (solvable with open and honest discussion).



Optimising Heat Acclimation across the National Institute Network – Professor Julien Périard and Josh Elliott, University of Canberra

Tuesday 29th October 1:30pm – 2:30pm



Presented by Professor Julien Périard

Professor Périard is Deputy Director of the University of Canberra Research Institute for Sport and Exercise (UCRISE), where he also leads the Environmental Physiology Research Laboratory. His integrative research examines the physiological mechanisms that mediate health and performance during exercise in adverse environments (heat and altitude), as well as the adaptations that stem from chronic exposure. He has worked with both amateur and professional athletes from various disciplines, along with National (e.g. Australian Institute of Sport) and International Federations (e.g. World Athletics and World Triathlon).



Presented by Josh Elliott

Josh is a PhD student at the University of Canberra Research Institute for Sport and Exercise (UCRISE). He has extensive experience in supporting recreational and elite athletes, including conducting physiology, biomechanics, and performance analyses. His current research is funded by Australian Institute of Sport (AIS) and focused on improving the translation of evidence-based practice for heat acclimation and acclimatisation into the applied setting. He has helped athletes with heat training for events such as the 2022 FIFA World Cup, Marathon Des Sables, and Ironman World Championships.

The presentation will outline the benefits of heat acclimation and the current state of knowledge regarding the integration of heat acclimation into the training program of elite athletes. An update will also be provided on the project aims of developing a heat response test for the high-performance network, evaluating heat acclimation practices across the network, and integrating the heat response test into the Athlete Management System (AMS). Examples of how the project has benefitted athletes and coaches, along with the practical lessons learned thus far, will also be presented.



Performance-centred practice: enhanced athlete characterisation will unlock individualised training and promote interdisciplinary engagement

Wednesday 30th October 1:30pm – 2:30pm



Presented by Dr Katie Slattery

Dr Slattery is a lecturer at the School of Sport, Exercise and Rehabilitation, UTS. A UTS alumni who began her sports science career as a physiologist at the NSW Institute of Sport (NSWIS) and then supported the women's track endurance cycling squad to the 2016 Rio Olympics as a performance scientist.

Her job as a performance scientist with an Olympic team took her to the highest levels of sport.

"We were going for gold in the team pursuit. Using a performance-centred approach, I worked closely with the coaches to forecast the performance required to win and then developed strategies that were in line with the team ethos and philosophy to best prepare the athletes."

"To do this, we leveraged the existing scientific literature and my own research to translate and apply these findings to our high-performance setting."

It was also her job to quantify training and provide in-competition support to the team. This included race analysis and scouting of competitors' performances to inform the coaches and athletes on how to best optimise our race strategy.

"The satisfaction is when all the pieces come together for the athletes. Looking back to when the team won the 2015 World Championships in a world record time, it was magic. Seeing the athletes in a state of flow. Knowing that they've done all the hard work, and were in the best possible state of readiness to perform." Katie said.

Returning to the NSWIS as the coach of the endurance squad, she discovered the importance of holistic athlete development and the relational side of coaching. "If you look at the physical, technical, tactical and mental constructs in isolation you're not getting a full picture on how well the athlete will perform," she said.

Katie has now shifted her focus to concentrate on conducting research at UTS and teaching the next gen of sport and exercise practitioners. Taking her learnings as a sports scientist and a coach to explore how to optimise performance using both quantitative and qualitative research methods





Presented by Dr Jamie Stanley

Dr Stanley is a sports physiologist, researcher and coach specialising in performance and recovery optimisation working with current world record holding, Olympic, Paralympic, Commonwealth, and World champion athletes. He is passionate about developing next practice in the daily training and competition environments and influencing transformational change at a system level that will have a lasting performance impact over time. Jamie is in a unique position holding roles with three different organisations. He is currently the Lead Physiologist for the Australian Cycling Team, Training Insight Lead for the Swimming Australia High Performance Unit and Senior Physiologist at the South Australian Sports Institute. Jamie also holds an adjunct research position at the University of South Australia and was the 2020 Exercise and Sport Science Australia Accredited Sport Scientist of the year.

The AIS is working with a syndicate known as Little Red Riding Hood that comprises of world-leading practitioners and researchers from the South Australian Institute of Sport, University of Technology Sydney, AusCycling, Swimming Australia, New South Wales Institute of Sport, Victorian Institute of Sport and the University of Western Australia. Aligned with the National Research Agenda priority for sports performance optimisation, a five-phase, multi-centre research project is being undertaken with the aim to facilitate an interdisciplinary approach to enhance individualised training design and monitoring for athletes.

As key stakeholders in sport performance, coaches, athletes and performance support staff were asked in focus groups, 'What makes athlete testing, monitoring and training more holistic?'. These responses informed the design of a series of projects with 36 swimmers and 39 cyclists to investigate how testing can be better used to characterise athletes and individualise training. What has resulted is the distillation of a bespoke framework and tools that promote 'performance-centred practice'.

A key aspect of performance-centred practice is having an athlete's performance as the focus of the training process. It moves away from approaching training prescription from a singular physical or technical perspective towards identifying, and then designing training to improve key performance objectives. The final phases of the project will evaluate the implementation of the performance-centred practice framework across the National Institute Network. The application of this AIS supported research has potential to refine best practice in holistic athlete preparation and interdisciplinary collaboration systemically across multiple able-bodied and para sports



Improving Statistical Literacy in Sport – Get up to SPEED!

Thursday 31st October 1:30-2:30



Presented by Dr Andrew Govus

The SPEEDs team consists of Dr Eugene Sachkou, Dr David Carey, Dr Minh Huynh, Dr Hareesh Suppiah, Dr Matthew Varley, and Dr Andrew Govus from La Trobe University and is advised by Richard Little from the Victorian Institute of Sport. The team includes experts in sports data analysis (Sachkou, Carey, Huynh, Suppiah, Varley and Little) and sports science practitioners (Suppiah, Varley, Little, and Govus), to ensure that the materials support the “on the ground” data science needs of sport scientists working within high-performance sport.

Despite the wealth of data available in high performance sport, many sport scientists lack the statistical literacy required to analyse these data in a timely and rigorous manner, limiting the insights they can provide to athletes and coaches. A potential reason for the lack of data literacy in sport and exercise science is that undergraduate and online educational materials do not use teaching scenarios or data that adequately represent the high-performance sport environment.

In this presentation, project lead Dr Andrew Govus will launch the AIS SPEEDS platform. SPEEDS is an online platform developed by La Trobe University on behalf of the AIS that aims to provide a “just-in-time” statistical learning experience for sport scientists working within high-performance sport. We hope to encourage sport scientists to engage with the platform to enhance their data analysis skills and overall statistical literacy. Finally, we call for collaborators interested in helping us develop the platform so we can continuously improve open-source learning materials that can enhance statistical literacy within sport and exercise science.



Aussie Abroad - Q&A with Blake McLean, Associate Professor, School of Sport, Exercise & Rehabilitation, University of Technology Sydney and Director of Performance Research and Development, Oklahoma City Thunder

Friday 1st November 9:00am -10:00am



Presented by Associate Professor Blake McLean

Blake McLean serves as an Associate Professor at UTS and the Director of Performance Research and Development at the OKC Thunder. His dual roles with the Thunder and UTS allow him to collaborate on research and development endeavors across both academia and industry. With a background as an S&C coach and sports scientist with the South Sydney Rabbitohs, the University of Texas, Collingwood FC, and Wests Tigers RL, Blake has accumulated extensive expertise and experience in applying scientific thinking to support decision-making in the heat of week-to-week professional competition.

In his current role, Blake leads a range of interdisciplinary research and development initiatives, working with a team of practitioners striving to optimise availability and readiness for the 82-game regular season and playoffs.

In this STARS session, Blake will talk about his journey, his experiences in setting up decision support systems in a variety of environments, and his current research interests.



How does the fit of garments and equipment affect human performance?

Friday 1st November 11:00am – 12:00am



Presented by Dr Celeste Coltman

Dr Celeste Coltman is the theme leader of the Applied Biomechanics Research Group within the University of Canberra Research Institute for Sport and Exercise (UCRISE) and an Associate Professor in the Discipline of Sport and Exercise Science at the University of Canberra. Celeste's research program focuses on women's health biomechanics in both sporting and occupational settings. She draws upon biomechanics, human factors, ergonomics, and design research methodologies in her research practice. Celeste has a particular interest in the development of equipment, products and technologies that improve women's health and performance. Since her PhD conferral (University of Wollongong), she has attracted >AU\$2.5 million in external grant funding and published > 35 scientific papers. She has been a Defence Science and Technology Group Research Fellow since 2018 and is the inaugural Early Career Research Representative for the Australian and New Zealand Society of Biomechanics. Celeste manages, supervises, and mentors a research group of research assistants, PhD candidates and Honours students in the fields of biomechanics, human factors, design, and women's health. She is also the director and co-founder of the Biomechanics Research and Innovation Challenge (BRInC) program, a national biomechanics-based mentoring program for girls and early career women in biomechanics.

Advancements in garment and equipment design have played a significant role in enhancing human physical performance, but how is human performance affected by garments and equipment that do not fit the end user correctly? This presentation will overview the impact of the fit of garments and equipment on human performance, drawing on examples from sport and occupational settings to highlight why fit *really* matters.



Aerodynamic engineering for performance impact: Australian Centre for Sports Aerodynamics

Friday 1st November 1:00pm - 2:00pm



Presented by Dr John Pitman

After initially starting out with a career path oriented towards motorsport engineering, John discovered a keen interest in aerodynamics and switched focus. After an MSc in Aerodynamics in 2009-10, he worked at Jaguar Land Rover aero department for 7 years. During this time through Jaguar cars' sponsorship of Team Sky, John became involved with various cycling projects including helmets for Chris Froome in the Tour de France and Bradley Wiggins' Hour Record.

John moved to Australia for an Aerodynamics role with Cycling Australia in 2017, working on all aspects of aerodynamics and associated performance. He was a key driver of the specification and design of the ACSA wind tunnel.

After a period of independent consulting in 2022-23, John joined SASI as Head of Aero in January 2024, overseeing all build and commissioning.

Looking forwards, the role is about continued development of the facility and service delivery to implement real uplifts in performance across a wide range of identified Summer and Winter Olympic / Paralympic sports.

Through a number of case studies, John will present the range of aerodynamic performance services the ACSA team is offering and the resulting performance impact.

The centrepiece of the ACSA is the new wind tunnel in Adelaide, SA, however the team's system boundary extends well beyond this. With performance modelling, analysis, field testing, computational simulation and design to help Australian NSOs discover, develop and implement real aerodynamic gains.... and go faster!



How to increase mental activity and enhance mental recovery in athletic populations: learnings from and AFLW preseason

Friday 1st November 2:30pm – 3:30pm



Presented by Dr Suzanna Russell

Suzy is an industry based Postdoctoral Researcher at the Sports Performance, Recovery, Injuries, and New Technologies (SPRINT) research centre, at Australian Catholic University. Having held various positions across research, industry, and applied sport, Suzy holds expertise in fatigue, recovery, sleep and supporting the female athlete. Her recent postdoctoral work, in partnership with the Australian Institute of Sport and Queensland Academy of Sport, focused on mental fatigue and mental recovery in athletic populations.



Presented by Carissa Gardiner

Carissa is a Postdoctoral Researcher at the Australian Catholic University (ACU) within the Sports Performance, Recovery, Injuries, and New Technologies (SPRINT) research centre. Her research is primarily focused on the effects of psychoactive substances on subsequent sleep, with interest in commonly consumed substances including caffeine and alcohol. Additionally, Carissa has expertise around the importance of sleep for athletic populations. Her experiences include supporting national and professional athletes to improve sleep through the provision of sleep education and practical strategies, including managing time-zone adjustments during international travel.

Mental fatigue, and its potential subsequent impact on aspects of athletic performance, has attracted increased scientific attention. The evidence base supporting practical approaches for increasing mental activity and enhancing mental recovery in athletes is however lacking. This presentation will share athlete responses to five differing 15-minute experimental conditions including; social media exposure, use of a cognitive task app, biofeedback breathing, sitting quietly, and a coach designed field-based sports-specific cognitive loading task. Insights shared will inform coaches of potential ways to manage athlete mental activity and recovery in the elite sport setting.



