



ISBS 2018

Auckland, New Zealand

10-14 September

COUNTDOWN — 5 days before the opening ceremony!

Key fact

- 489 delegates registered from 32 countries.

Key dates

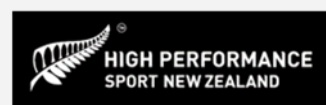
10 September 2018

• **Please upload your presentation** by sending to ISBS2018@aut.ac.nz, or at **the latest by 14:40 on Monday 10th September** in person at the conference with Dr Jono Neville jono.neville@aut.ac.nz. This is particularly important for the digital posters, as these are converted into video files to be played on the SAMSUNG TV screens in the conference venue.

Important notices

- Note there is a **SAMSUNG phone and DeX station** as a **prize for the best use of video or interactive technology in any of the digital posters**. There are also prizes for the best orals from the ISBS conference organizing committee. Prepare your presentations to the best of your ability to be informative, entertaining, and with clear messages and great science.
- This conference is an **eco-friendly sustainable conference**. Therefore all documents (programme, presentation schedule, papers, proceedings etc.) are **ELECTRONIC ONLY. Download documents before you travel. Please bring your digital device** (e.g. phone, ipad, laptop etc.) so you can read the conference documents, and receive messages during the conference.
- As there is a wait list for the AUT Millennium applied sessions and Sir Graeme Avery event (bus bookings are at the maximum), and the marae and sky tower social tour, **if you are NOT going to these events, please inform the registration staff**. Please check your name badge so you know which AUT Millennium sessions and tours you are at. We apologize if you have not been allocated to your preferred choice due to numbers exceeding spaces.

HOSTS



NEW PRIZE FOR THE BEST ISBS DIGITAL POSTER USE OF VIDEO OR OTHER INTERACTIVE TECHNOLOGY



There is a new PRIZE for the best ISBS digital poster use of video or other interactive technology. Professor Mike McGuigan is chairing the judges who will rate the digital posters based on:

- Visual appeal
- Innovation
- Use of biomechanics technology
- Applied biomechanics

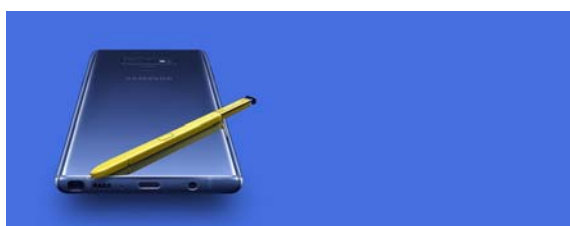


Win the Samsung Note9 and the Samsung Multi media DeX dock.

<https://www.samsung.com/nz/smartphones/galaxy-note9/>

<https://www.samsung.com/nz/mobile-accessories/dex-pad-ee-m5100/>

<https://www.youtube.com/watch?v=tZ1bDEoEwYw>



SAMSUNG

Thanks to Diamond Industry Partner Samsung and AUT for these amazing prizes.

YOUR POSTER PITCH SESSION FOLLOWED BY YOUR SAMSUNG DIGITAL POSTER SESSION

Poster pitch delegates; you have one minute for the poster pitch in the lecture theatre. After the one hour session of 9-10 speakers, you then stand by the Samsung poster screens, where your power point is on automatic play for 5 minutes, then changes to the next person, then back to yours. This repeats for an hour – where you both stand by the digital poster. The posters will also be on rotation throughout the conference - so your work will be seen throughout the 5 days. This is why you need to upload your presentations before 14:40 on Monday 10th September.

PARTNER AND PRE AND POST CONFERENCE TOURS

Orbit Travel

ISBS 2018 tour registrations are now closed, please contact the vendors directly to make your booking.

Sky Jump: NZ\$225 booking via <http://skywalk.co.nz/about/skyjump>

Sky Walk: NZ\$150 booking via <http://skywalk.co.nz/about/skyjump>

Jet Boat: NZ\$98 booking via <http://www.aucklandadventurejet.co.nz/>



OPENING PROCEEDINGS—FLAG BEARERS

Congratulations to the following delegates who were selected to participate as flag bearers during the opening ceremony—they were the first from their country to register for the conference.

Flag bearers

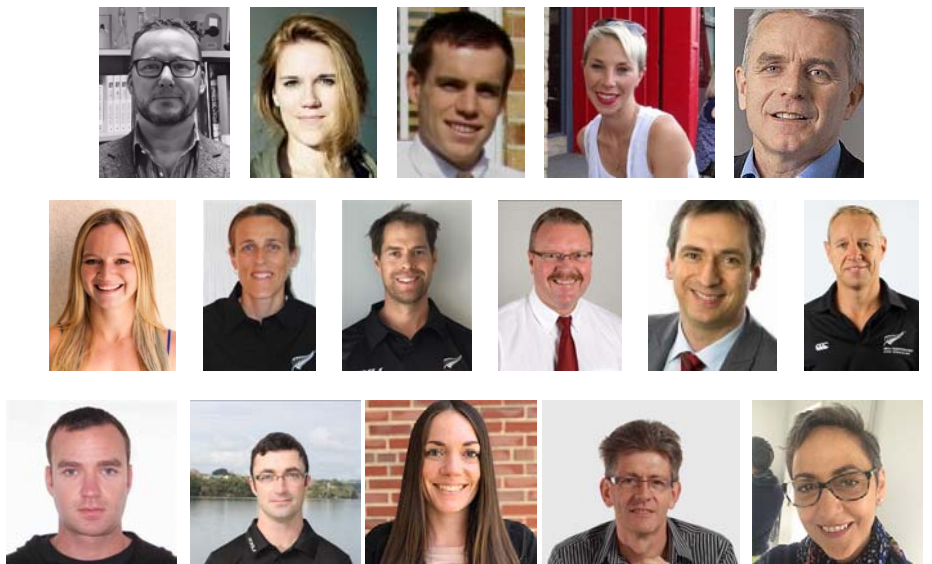
Timothy Ackland	Australia
Ine Mylle	Belgium
Zachariah Henderson	Canada
Kangwei Ai	People's Republic of China
Marion Mundt	Germany
Peter Katona	Hungary
Rajinikumar Palaniyappan	India
Andrew Harrison	Ireland
Matteo Zago	Italy
Natsuki Sado	Japan
Ji Hyun Jang	Korea
Jeroen Van Der Eb	Netherlands
Anthony Sharp	New Zealand
Helen Bayne	South Africa
Raúl Arellano	Spain
Hannah Wyatt	UK
Gretchen Oliver	USA
Cassie Wilson	England
Enora Le Flao	France
Rodrigo Bini	Brazil
Sydney Dreves	Scotland



THE TYPES OF DELEGATES AT THE CONFERENCE

- 173 Full delegates
- 114 Student delegates
- 27 Accompanying persons
- 5 Hosts
- 10 Organising Committee
- 23 Organising Logistics
- 15 Organising Assistants
- 27 Industry partner delegates
- 54 Invited speakers
- 15 AUT staff
- 21 AUTM invited guests
- 6 Day passes

- 491 total people at conference



FISHING IN NEW ZEALAND'S WONDERFUL SCENERY

Participate in the Kiwiana Industry Playing Field competition to catch fish—whilst balancing on one leg—to win prizes given out at the closing ceremony.

Thanks to Nik <http://www.gin-clear.com/company/contact.html> for the Source DVD that will be playing during the Kiwiana opening. Copies can be watched online at <https://vimeo.com/ondemand/thesourceseries/112978155>. Steve is a fishing guide in Taupo and he can organise fishing guides <http://www.fishysteve.com/>. He is also part of the guides association <http://www.fishingguides.co.nz/fly-fishing/central-north-island-taupo-turangi/>

HOW THE LONG TABLE LUNCHEON'S WORK

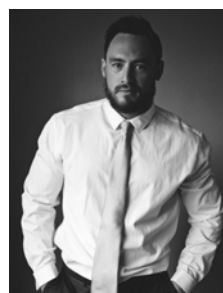
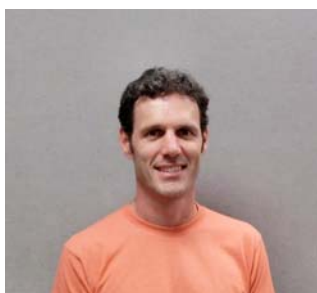


Te Kaporeihana Āwhina Hunga Whara

The aim of the long table luncheons is for delegates to discuss issues of important to biomechanists. The paper table cloths are to be written on by delegates. The points will be summarised and presented at the start of the luncheon the following day. The key points will be collated and summarised for an article published by the ISBS conference organisers. All those who write their names next to the their



comment will be acknowledged. An example is the **ACC Sports Injury Prevention long table luncheon on** Wednesday. The facilitators for the discussion will include Natalie Hardaker, Dr Richard Ellis, Dr Ken Quarrie, Dr Mark Fulcher, Ms Sharon Kearny, Dr Anna Lorimer, Prof Duncan Reid, Mr Isaac Carlsson, and Dr Chris Whatman.



KARAKIA—BLESSING FOR THE FOOD

During the Kiwiana Opening reception Dr Sarah-Kate Millar will be providing the Karakia—blessing of the food.

Nau mai e ngā hua
o te wao
o te ngakina
o te wai tai
o te wai Māori
Nā Tane
Nā Rongo
Nā Tangaroa
Nā Maru
Ko Ranginui e tū iho nei
Ko Papatūānuku e takoto nei
Tuturu whakamaua
Kia tina! TINA! Hui e! TĀIKI E! I



AUT DIGITAL, KIWIANA PHOTO BOOTH, SOCIAL MEDIA

The Kiwiana photo booth and social media centre allows you to express your new learnings from the conference and share them with colleagues unable to attend the conference in person. There will be prizes for the best photos taken at the dress-up photo booth. Some of your social media team, led by Kylie Robinson include:

- Jack Mapobpan, Jono Neville, Farhan Tinwala, Shelley Diewald – TV screens and digital posters and lecture presentations
- Tim – VUTA bot and flip screens
- Jacqueline Alderson, Mike McGuigan – Keynote live question interactions, and academic social media content
- Josh McGeown, Enora Le Flao, Eric Harbour – Delegate engagement in social media and academic social media content
- Jessica Yeoman, Beau Thoresen – AUT Millennium event social media and marketing
- Lisa Keeley – photographer for formal events, and during academic and social events
- Chris Tillack – web
- Dan Evans – IT support
- Andrea – media releases and coordination of print, radio and TV journalists



Please upload your presentations by sending to ISBS2018@aut.ac.nz, or at the latest by 14:40 on Monday 10th September in person at the conference with Dr Jono Neville jono.neville@aut.ac.nz. We encourage uploading your presentations early so they can be checked by our team to avoid any software issues (e.g. videos not playing correctly). This is particularly important for the digital posters, as these are converted into video files to be played on the SAMSUNG TV screens in the conference venue.

VUTA has embedded Maze Maps to help with wayfinding for delegates. For example:



Join us at AUT for the ISBS 2018 conference:

isbs2018.com

isbs2018@aut.ac.nz

Facebook [ISBS2018](#)

Twitter [ISBS_2018](#)

Thanks to our Social Media Coordinator Kylie Robinson for gaining these paper author profiles. If you would like your paper and research to be profiled, contact Kylie at

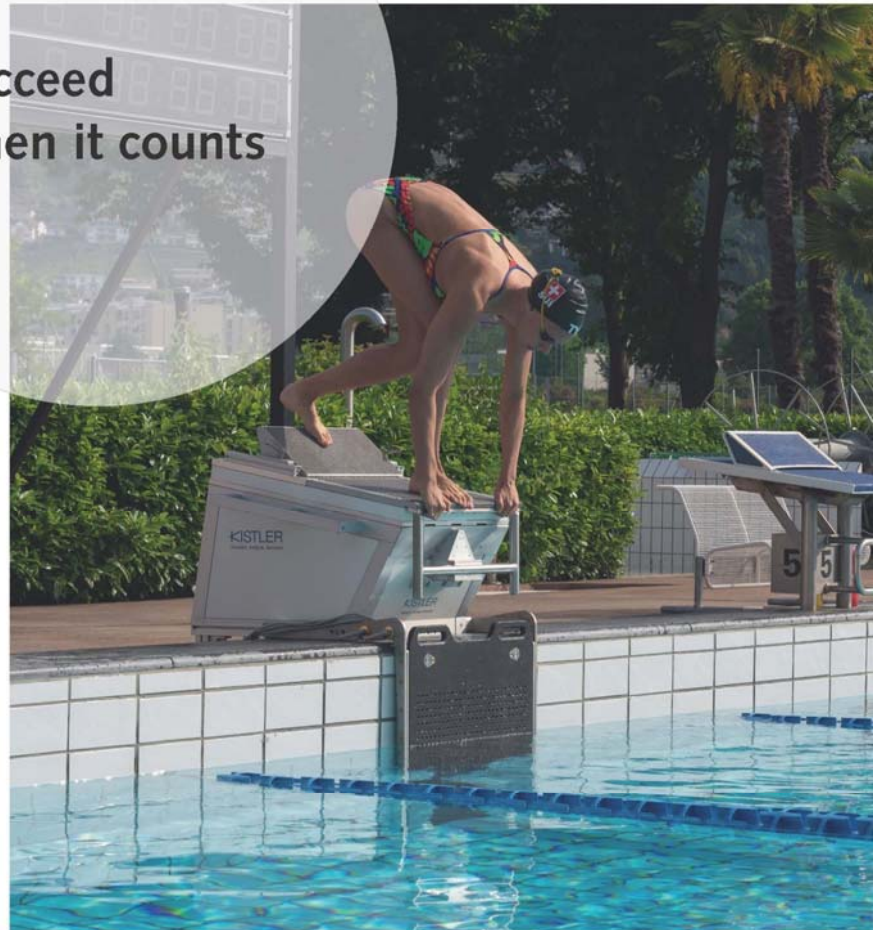
kylie.robinson@aut.ac.nz.



CREATION OF DIGNITARIES HAND CARVED GIFTS

Master wood carver Jarrod Hume was commissioned to create hand carved pohutukawa and kauri (native NZ trees) items for dignitaries. Jarrod has reclaimed the wood from fallen trees at Kawau Island in Auckland's Hauraki Gulf. He dried the wood for two years, hand carved the items, then added Pasifika art work of his own creation using a wood burning device (pyrography). The ISBS 2018 kaikōrero Dr Valance Smith will perform the traditional Māori blessing of gifts for dignitaries at the opening ceremony. ISBS 2018 Auckland Student Coordinator Joshua McGeown met Jarrod to check on the progress of the wooden spatulas. The cell phone photo shows the spatulas at the blank stage before sanding and pyrography. The spatulas are oiled with NZ olive oil so can be used for serving and cooking—though many prefer to display as an artwork.





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when it counts

Performance analysis systems KiSprint and PAS-S. Superior human performance through profound motion sequence and force measurement analysis.

Visit us at our booth for more information
or check our new website
www.kistler.com/biomechanics

www.kistler.com

KISTLER
measure. analyze. innovate.

WHAT YOUR NAME BADGES INDICATE

We have completed research to identify the best type of name badge for the conference. A successful name badge is worn close to the face (i.e. not a hanging lanyard name badge), has a large name that can be read from a distance, has a clear indication of what events you go to, and has a conversation starter. Therefore, our ISBS 2018 Auckland Conference name badges do not have any supporting industry partner or host logos, as these would be too small to be read easily, and are available on the 20 Samsung screens, four Samsung Flip screens, lecture theatre screens, and are in the eproceedings.

We also had to consider the conference focus on using sustainable practices, including no single use plastics. This means your name badge is a recyclable plastic tag which will be collected for recycling at the Middle Earth dinner entry.

Your name badge has only your first name, with indicator stickers, and with a space for you to write a conversation starter word. **If you do not wish to be called by your first name at the conference—as is the Kiwi way—then please bring your own name badge.**

Your name badge is your ticket to all events so must be worn at all times. Your name badge has a number of stickers that are symbols for the events, workshops and AUT Millennium sessions you are going to. You can see the type of delegate based on the colour of the name badge. Applied sessions at AUT Millennium sessions are smiley faces or hearts of various colours. The buzzy bee indicates a dietary request. Only people with a buzzy bee on their name tag will be able to eat food from the special diet table (e.g. Halal, Gluten free, Vegan etc).

Given the conference approach of multidisciplinary we have used creative name badges instead of traditional name badges. We hope you enjoy discussing what all the stickers mean, as these are again conversation starters.

At registration you will be asked to write your one word conversation starter on your name badge to indicate what other delegates should **"ask me about ..."**. In my (Patria) example the word is Injury—for injury biomechanics.

Your name badge contains your Kiwiana jigsaw piece to use at the opening reception.



Full delegate	Student delegate	Accompanying person	Day pass + AUTM invited
Host	Invited speaker	Industry Partner	Organising team + AUT

Applied sessions

-  Sports medicine & biomechanics
-  Athlete development biomechanics
-  Inertial sensors and motion capture – Running and basketball
-  Sprinting – Performance and rehabilitation
-  The impact of innovation in biomechanics
-  Wearable technology in snow sports load monitoring
-  Integration of biomechanics in the coaching of elite throwers
-  Cycling biomechanics
-  Paralympic swimming technique analysis and development
-  Rowing Stroke Analysis

Social tours

-  Sky Tower
-  Maori cultural experience

Other

-  Student / Mentor programme
-  VIP night
-  Dietary requirement
-  Gym Membership

NEW INDUSTRY PARTNER—ASICS

Asics have come on board as an Industry Partner for the conference, and as part of this they are providing five pairs of Kayano running shoes to be given away during the conference. Chris Horrocks <chrish@britwyn.co.nz> from Asics says:



“Asics Kayano-25 signals a quarter of a century of technological advancement. If your current runners have seen better days, and you’d like to run away with your very own pair of Kayano 25’s, we want to hear from you, so tweet us at @ISBS_2018 why you should be one of the chosen ones.”

Asics have a regular Thursday night run (Asics Move Club) from their Britomart store, with 5 and 10 Km options (<https://www.facebook.com/events/2053263901384871/>). ISBS 2018 Conference delegates are welcome. Running with Asics regular runners will be a great way to get our actively explore the city.

You will recognise the ISBS 2018 Auckland conference assistants in their Blue Asics shirts.

ISBS 2018 Auckland conference has been gazetted

What is gazetting? Source: <https://www.iponz.govt.nz>

Gazetting is the process of asking the Commissioner of Patents and Designs to officially record an event as an industrial exhibition. Once approved, the event is advertised in the Intellectual Property Office of New Zealand (IPONZ) Journal.

Gazetting opens up a six month window of opportunity to file a New Zealand patent or design application after an invention or product design has been displayed at a gazetted event. In this situation, no one can use the information displayed or presented at the gazetted industrial exhibition to challenge the novelty of the application filed within the 6-month window. Publicity or use of the invention outside of the event (e.g. discussions with potential developers, customers or media articles) is not covered and must therefore be avoided if a patent or design application is to be made.

The ISBS 2018 Auckland conference has been gazetted:

“I confirm the ‘International Society of Biomechanics in Sports Conference (2018 ISBS Conference)’ notice was advertised in Journal 1669 which published 27 July 2018.”

Margaret Newton, Quality Assurance, Reporting and Systems Administrator, Intellectual Property Office of New Zealand, Market Services Group, Ministry of Business, Innovation and Employment. Email margaret.newton@iponz.govt.nz | DDI +64 49783618 | 15 Stout Street, PO Box 9241, Marion Square, Wellington, New Zealand. www.iponz.govt.nz | NZ Freephone 0508 447 669 | AU 1800 796 338 | International: + 64 3 962 2607



WHAT TO PACK FOR ISBS 2018 AUCKLAND

Gary Putt, (Manager - Industry Engagement, Research & Innovation Office), was the first to try on the ISBS 2018 Conference Puffer Jacket. The bright blue and orange jackets are warm which is great for the Auckland spring weather.

What to pack for Auckland ISBS conference attendance:

- ◇ Your digital device as this is a digital conference (no paper) given the sustainability theme
- ◇ USB drive to transfer your presentation during registration (all presentations must be uploaded before 14:40 on Monday 10th) - or please upload to the ISBS email before then so your presentation can be checked. This is especially important for poster presenters—as all posters are transferred to video files for the showing on the new Samsung screens.
- ◇ Walking shoes (for the Sky tower and city walking tour)
- ◇ Easy to slip off shoes (for the Marae visit)
- ◇ Long trousers or skirt for the Marae visit
- ◇ Rain coat—yes it might rain given it is spring
- ◇ Fun clothing for the Middle Earth (Lord of the Rings themed) banquet—optional if you are into dressing up and trying to win the best dressed prize!
- ◇ A positive attitude and being willing to try new ways of engaging and learning during the ISBS 2018 Auckland conference.



KISTLER STUDENT LUNCHEON LONG TABLE DISCUSSION

KISTLER
measure. analyze. innovate.

The Kistler student biomechanics long table discussion luncheon is an opportunity for delegates to discuss with ISBS Board members the opportunities for student biomechanists in laboratories, industries, universities, sports clubs around the world. The suggestions and comments will be summarised and reported back the next day of the conference, and will also be submitted as a journal article.



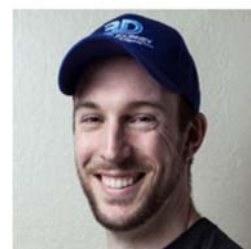
KISTLER STUDENT BIOMECHANICS LONG TABLE DISCUSSIONS. WG201, WA224, WG306. Facilitators include ISBS Board members Dr Gillian Weir, Dr Tim Exell, Dr Neil Bezodis, Dr Laura-Anne Furlong, Dr Sarah Clarke, Dr Gerda Strutzenberger, Dr Ezio Preatoni, Dr Kevin Ball, Prof Peter Sinclair, Prof Nunome Fukoka, Dr Shinji Sakurai, Dr Wen-Tzu Tang, Dr Cassie Wilson, Dr Helen Bayne.

SPORTS TECHNOLOGY SHOWCASE UPDATE

Friday 14th September 13:00-14:50, WG401

The coordinators Amber Taylor (AUT Ventures), Rosanne Ellis (AUT Research and Innovation Office), and Ryan Archibald (ATEED) have selected companies with new products to be explored by biomechanists. We hope you gain ideas for your research and learn how to commercialise your products at this showcase. ISBS 2018 Auckland Conference Industry Partner Tekscan are supporting the lunch during the showcase.

1	AUT Strain-gauge	Jono Neville	Jono.neville@aut.ac.nz
		Farhan Tinwala	Farhan.tinwala@gmail.com
		Shelley Diewald	Shelley.diewald@aut.ac.nz
2	Myovolt	Steve Leftly	steve@sentrixtechnology.com
		Farshid Sarmast	farshid.sarmast@gmail.com
3	Avice	Parn Jones	parn@avicewearables.com
		Eric Helms	eric@avicewearables.com
		Wilson Huang	wilson@avicewearables.com
4	Pressure Mat	Xiaoyou Lin	xiaoyou.lin@aut.ac.nz
		Bandt Li	brandt.li@aut.ac.nz
5	Beta Energy Drink	Holly Sutich	holly@sutich.biz
		Bradley Phagan	bradleyphagan@gmail.com
6	MyBio Motion	Arien Hielkema	arien@mybiomotion.com
		Yasir Al-Hilali	yasirhilali@gmail.com
7	Circuband	Daniel Thomson	danielthomson@circuband.com
		Emily Coates	emily.coates@hotmail.co.nz
8	Physio Wear	Colin Anderson	isinfier@gmail.com



SPRINZ-HPSNZ-AUT MILLENNIUM APPLIED PROGRAMME

	Presentation Title	Location	Presenters	Presentation description
1	Swimming (I1) Paralympic Swimming Technique Analysis & Technology Development	AUTM Sir Owen Glenn Aquatics Centre	Jodi Cossor	A demonstration of a multidisciplinary approach driven by biomechanical analysis for Paralympic swimmers. Dr Jodi Cossor and Matt Ingram will show contrasting approaches to technique optimisation for individual abilities and opportunities.
2	Rowing (J1) Rowing Stroke Analysis	AUTM Sir Owen Glenn Aquatics Centre	Justin Evans and Sarah Kate Millar	A practical session delivered by Justin Evans and Dr Sarah-Kate Millar assessing the athletes rowing stroke to assist the coach on technical changes. This session will demonstrate various rowing traits and how the biomechanist and coach can work together to optimise boat speed.
3	T+F (G1) Utilising Biomechanics in Track & Field Throwing Events	AUTM Sports Hall Ground Level - Track side by roller door	Mike Schofield and Kim Hébert-Losier	This session looks at hammer throwing and the evidence based approach to coaching. The session will be delivered by Mike Schofield who works alongside Athletics NZ coaches to develop understanding of performance in a new and refreshing light. Industry partner: Qualysis.
4	AD (B1) Biomechanics Related to Athlete Development	AUTM Sports Hall Ground Level - Long jump pit area	Craig Harrison	Dr Craig Harrison and Prof John Cronin will provide examples from the AUTM Athlete Development programme.
5	Sprinting (D1) Sprint & Strength Biomechanics	AUTM Sports Hall Ground Level - Sprint lanes next to HPSNZ zone	Kim Simperingham and Jamie Douglas	Kim Simperingham who works with high performance rugby athletes will outline sprinting mechanics in practice.
7	Sports Med (A1) Sports Medicine & Biomechanics	AUTM Large seminar room Level 2	Bruce Hamilton, Fiona Mather, Justin Ralph and Rone Thompson	Dr Bruce Hamilton and Prof Duncan Reid will explain and show how the HPSNZ medical support system works in with sports science practitioners for service, education and research to help elite athletes and coaches.
8	Running (C1) Integration between inertial sensors & motion capture – running & basketball	SPRINZ SKIPP Clinic Level 1	Kelly Sheerin, Thor Besier and Denny Wells	Kelly Sheerin and Prof Thor Besier will provide examples of using IMU and 3D methods for running biomechanics research, education and service.
9	Cycling (H1) Cycling Biomechanics - Forces & Physiology -	SPRINZ Endurance Performance Clinic Level 1	Rodrigo Bini and Andrew Kilding	Dr Rodrigo Bini & Assoc Prof Andrew Kilding will show how linking of biomechanics and physiology improves injury prevention and performance enhancement.
10	Innovation (E1) The Impact of Innovation on Biomechanics	AUTM Small seminar room Level 2	Robert Tang, Andre de Jong, Sean Zhou, Stafford Murray and Farhan Tinwala	Robert Tang, Andre de Jong and Sean Zhou discuss select projects developed by Goldmine, HPSNZ's in-house engineering team, and how these innovations have enabled unprecedented levels of biomechanics feedback.
11	Snow (F1) Wearable Technology in Snow Sports Load Monitoring	SPRINZ S&C Lab Clinic Level 1	Cameron Ross and Paul McAlpine	Cameron Ross demonstrates the technology being used at the Snow Sports NZ training centre in Cardrona to enhance load monitoring of athletes. This application allows greater insight into training performances and biomechanical loads than has been previously possible in the training environment.

INDUSTRY PARTNERS



SPORTS TECHNOLOGY AND INDUSTRY PARTNERS



INDUSTRY PARTNER—STT SYSTEMS SHOWCASE

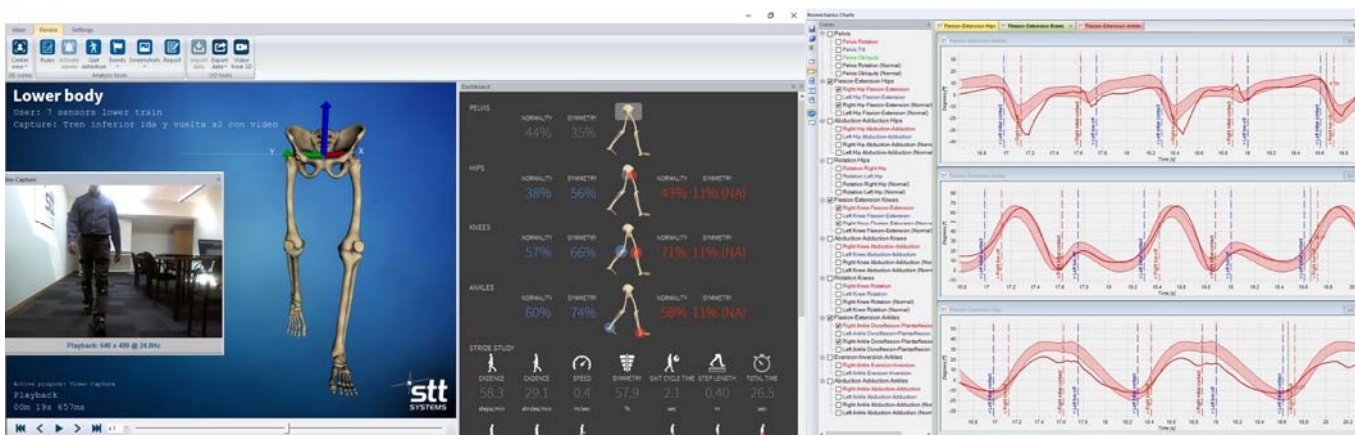
Sports 3DMA

Sports 3DMA belongs to a family of products built upon '3DMA', a powerful 3D motion capture engine used by biomechanists, sports scientists, PT and doctors all over the world through its various packages. In particular, Sports 3DMA includes running, cycling and golf swing protocols, as well as a full body protocol. Analyze the entire body from head to toe with a single capture.



iSen

iSen is an inertial motion capture system based on 400 Hz Wi-Fi IMUs that lets you work with any sensor configuration, from just a single STT-IWS sensor to a 17-sensor, full-body configuration. Clinicians, coaches, trainers, and researchers can capture accurate 3D motion data in real-time: orientations (angles) as well as angular velocities and accelerations. Advanced algorithms (Kalman filters) overcome the usual drift problems associated with inertial sensors.



For further information contact Fernando Echaniz <fechaniz@stt-systems.com>



NEW INVESTIGATOR AWARD JUDGES

New Investigator Awards

Chair:	Neil Bezodis	UK	n.e.bezodis@swansea.ac.uk
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Judge	Affiliation	Country	Email
Semi-final oral judge			
Ezio Preatoni	University of Bath	UK	e.preatoni@bath.ac.uk
Philip Graham-Smith	Aspire Academy	Qatar	Philip.GrahamSmith@aspire.qa
Gareth Irwin	Cardiff Metropolitan University	UK	Glrwin@cardiffmet.ac.uk
Hermann Schwameder	Universitat Salzburg	Austria	Hermann.Schwameder@sbg.ac.at

Final poster judge

Barry Wilson	Auckland University of Technology	New Zealand	barrydwilsonnz@yahoo.com
Gerda Strutzenberger	Universitat Salzburg	Austria	Gerda.Strutzenberger@sbg.ac.at
Young-Hoo Kwon	Texas Woman's University	USA	ykwon@twu.edu

Final oral judge

Bruce Elliott	University of Western Australia	Australia	Bruce.Elliott@uwa.edu.au
Sarah Clarke	NMU	USA	sabreen@nmu.edu
Cassie Wilson	University of Bath	UK	c.wilson3@bath.ac.uk
Hiroyuki Nunome	Fukuoka University	Japan	nunome@fukuoka-u.ac.jp

Feel like a luxury day trip or overnight trip on Kawau Island?

Kawau Island—The Beach House Luxury Accommodation—Plan a day trip or overnight trip.

<https://kawaubeachhouse.co.nz>. **Phone:** +64 9 422 8850, **Email:** info@kawaubeachhouse.co.nz

The Beach House is a peaceful luxury boutique hotel boasting beach front suites like the popular Vivian Bay Beach Suite or the Deluxe Pohutukawa Beach Front. This unique landmark shares a white sand beach with very few others, has splendid views over the glistening waters of Vivian Bay and the ever changing light of the Tawharanui regional park. Nature, in every sense, is important to us, as is our animated native wildlife, the delight of a couple holding hands at sunset and the delivery of true service. It is a rare place where the decadence of the past is married with the modernism of today. The food is location-inspired, ingredient-led and flavour fuelled. Enjoy a gourmet breakfast included in your rate. Lunch is a casual affair with a choice of platters and drinks alfresco. Our new Degustation Dinner menu offers a three or five course selection with carefully selected wines to showcase New Zealand's produce.



MĀORI DESIGN MEANINGS

A kete is a traditional Māori flax woven bag. Kete's are being used as the presentation bags for the thank you gifts to the invited speakers at the conference.

Acknowledgement. Text has been adapted from https://boneart.co.nz/pages/meanings_for_educational_purposes_only. The Bone Art Place sells Maori carvings and can be contacted on [+64 9 278 5156](tel:+6492785156), and don@boneart.co.nz.



Every carving has a very special meaning or story behind its design. The carvings based on Maori designs in particular have special significance. The pre-European Maori had no written language so tribal history and the stories of the gods were kept using many forms of fine arts and crafts ranging from basket and cloth weaving to complex wood, bone, shell and jade carving. These artefacts were then handed down through generations of tribal elders and became sacred objects or treasures "Taonga", telling the history of a tribe and taking on the spirits of past great leaders and warriors who had worn them. It is believed that a carving which is worn with respect or given and received with love, takes on part of the spirit of those who wear or handle it. In this way it becomes a spiritual link between people spanning time and distance. A carving that has been worn by family or tribal members over many generations contains the spirit of all of those people and is truly a great and powerful treasure. Pendants, jewellery and various tools such as needles, spear tips and fish hooks made from bone developed into a fine art form with great importance being placed on every piece, many of which took years to make using stone tools. Some have inlays of precious stones or colourful shell and all have a story or meaning behind their design. The Maori have a great respect for nature and have many legends about the creation of the earth and all its inhabitants. Many of these legends revolve around the spirits or gods who created or protect each part of their world such as the mountains, the forests, the lakes and the creatures of the sea. Most carvings combine elements from several areas of mythology which interact with each other to tell a story. Each element has its own specific meaning and the way they are portrayed or combined is what gives a carving its own special character. The meanings of some elements vary from region to region but all share common roots. Some basic design elements and their meanings are:

Koru: Spiral. The spiral is a Koru, represents the fern frond as it opens bringing new life and purity to the world. It also represents peace, tranquility and spirituality along with a strong sense of re growth or new beginnings. The Koru is also often associated with nurturing so when interlocked with others is frequently used to represent the strength and purity of a loving relationship within a family.



Twist. The twist with its crisscross form represents the many paths of life and love and as such is regarded as the original eternity symbol. The single twist in particular shows the joining together of two people for eternity. Even though they sometimes move away from each other on their own journeys, they will always come together again sharing their lives and blending to become one. It tells how the strength of bond of friendship, loyalty and love will last forever. The double and triple twists have a similar meaning but refer more to the joining of two peoples or cultures rather than individuals. They also refer the three baskets of knowledge.



Manaia: Mythical being. The Manaia is an ancient mythical being with a birds head and a human form. It is said to be the messenger between the earthly world of mortals and the domain of the spirits illustrating the strong links the Maori people have with spirituality and the spirit world. It is a holder of great spiritual energy and is a guardian against evil. The Manaia can be seen blended into many Maori designs with subtle differences between tribes. The Manaia is often depicted with the three fingers of birth, life and death. It can also be shown with a fourth finger representing the afterlife and describing the circle of life.



Hei-Matau: Fish hook. These very stylised fish hooks represent strength, prosperity, abundance, fertility and a great respect for the sea. It also is said to provide good luck and safety when traveling over water so is often worn by travelers. Hei-Matau are also symbols of power and authority which are held in great reverence by the Maori people. They were used as a practical tool for fishing and were often decorated as a sign of respect for the creatures of the sea. There are many styles of Hei-Matau from the true hook designs to the more ornamental styles which became treasured heirlooms for generations following.



Whales, Dolphins and Turtles. The ocean has always been the dominant force for the Maori people who travelled huge distances in their long canoes and lived on the bounty of the tropical waters. They had a great respect for the creatures on the sea and in particular dolphins and whales. The whale with its great size and intelligence played an important part in the culture of the Maori people. They were often represented as an example of family love with mother and calf always side by side and touching at every opportunity. Beached whales were treasured as gifts from the gods. They were particularly prized for the bone which after several years of curing was used to carve ornate jewellery and art works, often passed down for many generations. A dolphin is a symbol of playfulness, harmony and friendship while the turtle is the sign of a navigator.



Toki: Adze. The Toki or Adze was used to carve the great canoes and also to cut and work timber for the for-tresses or Pahs in which the Maori lived. It was such an important tool in Maori life that it became regarded as a symbol of power, authority and good character. It is also the mark of the craftsman and artist.

Tiki. The Tiki is a very ancient symbol and is by far the least understood so there are a number of legends about its meaning. Some say he came from the stars and that he was the first man of the world. He is also often depicted with webbed feet which suggests a strong link to the creatures of the sea. Tiki was respected as the teacher of all things and the wearer of this symbol is therefore seen to possess clarity of thought, loyalty, great inner knowledge and strength of character. The Tiki is regarded as a good luck charm when worn and in some areas is also regarded as a fertility symbol.

SPORTS TECHNOLOGY AND INDUSTRY PARTNERS



STUDENT MENTOR SESSIONS

The ISBS student mentor programme is led by Dr Tim Exell. There are 46 mentors matched with 46 mentees (92 total). The ISBS Student Mentor Program will take place during a breakfast session so that mentors and mentees can meet and talk over breakfast in an informal atmosphere.

Mentor breakfast—Tuesday 11th 07:00 – 07:50, in the Wave Room (WG308)

Optional Additional Session: Friday 14th 16:30 – 18:00. There is no room associated with this session as it is there to provide a possible time when you might wish to catch up towards the end of the conference. Mentors that are involved in the post-conference board meeting will not be available at this time. Please arrange between yourselves during the mentor breakfast whether you would like to meet during this time on the Friday or if you would like to meet at another time during the week.

Students are asked to prepare for the mentor programme by considering which research topics and questions that they would like to discuss with their mentor. Students are advised to prepare a summary of their research so that they can provide the mentor with an overview at the first meeting. Student mentees that are presenting at the conference are sending their abstracts to the mentors.

Thank you to the mentors for generously agreeing to be part of the student mentor programme.

Dr Tim Exell
Vice President (Research and Projects)



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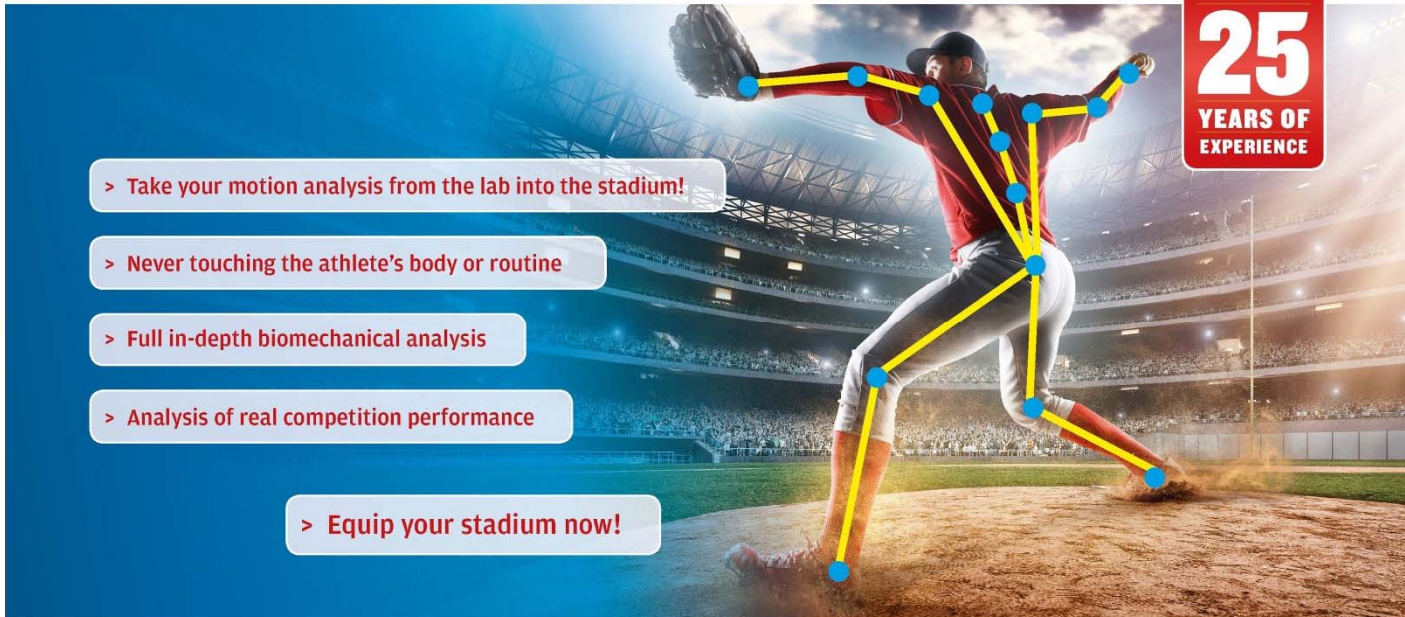
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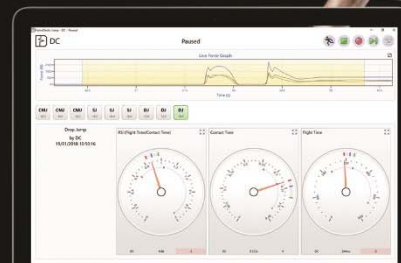
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also be a pop-up-shop at the conference venue, with some example NZ gifts. From N to Z stocks authentic New Zealand products and offers everything for the tourist and locals alike. Cultural Icons, postcards and everything in between, you will find a perfect souvenir and an incredible wealth of fun and knowledge. www.fromntoz.co.nz.

We thank Benny Li and the team for being part of the conference.



INDUSTRY PARTNER SUPPORT OF ACADEMIC AND SOCIAL EVENTS

Thanks to our Industry Partners for supporting workshops, lectures, tours, clothing and technology

FORCEDECKS Workshop - Commercialisation and funding Philip Graham Smith Monday

NORAXON Workshop Monday

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QUALISYS AUTM Applied Session Wednesday

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KISTLER Applied Session AUT Millennium - Olympic Athlete Joseph Millar

New Zealand sprinter Joseph Millar competing in the men's 100m.

Photo credit: Photosport

Joseph Millar broke both long-standing 100m and 200m sprint records at the New Zealand Track and Field championships held at Hamilton's Porritt Stadium in 2017.

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AUT Millennium Sir Graeme Avery Event — Richard Patterson

is a weightlifting competitor for New Zealand. He is one of two weightlifters to become a 3 x Olympian (Beijing, London and Rio) with the other being the legend weightlifter Don Oliver. Richard is also a 4 x Commonwealth Games representative winning Silver at the 2010 Commonwealth Games. Four years later, at the 2014 Commonwealth Games in Glasgow, he won the gold medal in the same event and was named New Zealand's flagbearer in the closing ceremony for his contribution to the wider team. Richard has a long association with AUT Millennium and credits his performances at the 2000 Sydney Olympics, and the 2002 Commonwealth Games Gold medal lift, to Graeme's son Nigel as his inspiration to pursue his ambitions of representing New Zealand on the world stage. Richard has been Vice President of Olympic Weightlifting New Zealand for the past five years and is a member of the NZOC Athletes Commission.



Thanks to our Industry Partners for supporting the food and beverages:

VICON beer and juice

STT SYSTEMS fruit baskets

AMTI Whittakers chocolate boxes

KISTLER Sports Technology long table luncheon Tuesday

ACC Sports Injury Prevention long table luncheon Wednesday

KISTLER Student Biomechanics long table luncheon Thursday

TEKSCAN Sports Technology Showcase Exhibition luncheon Friday

AMTI Student marae and hangi night

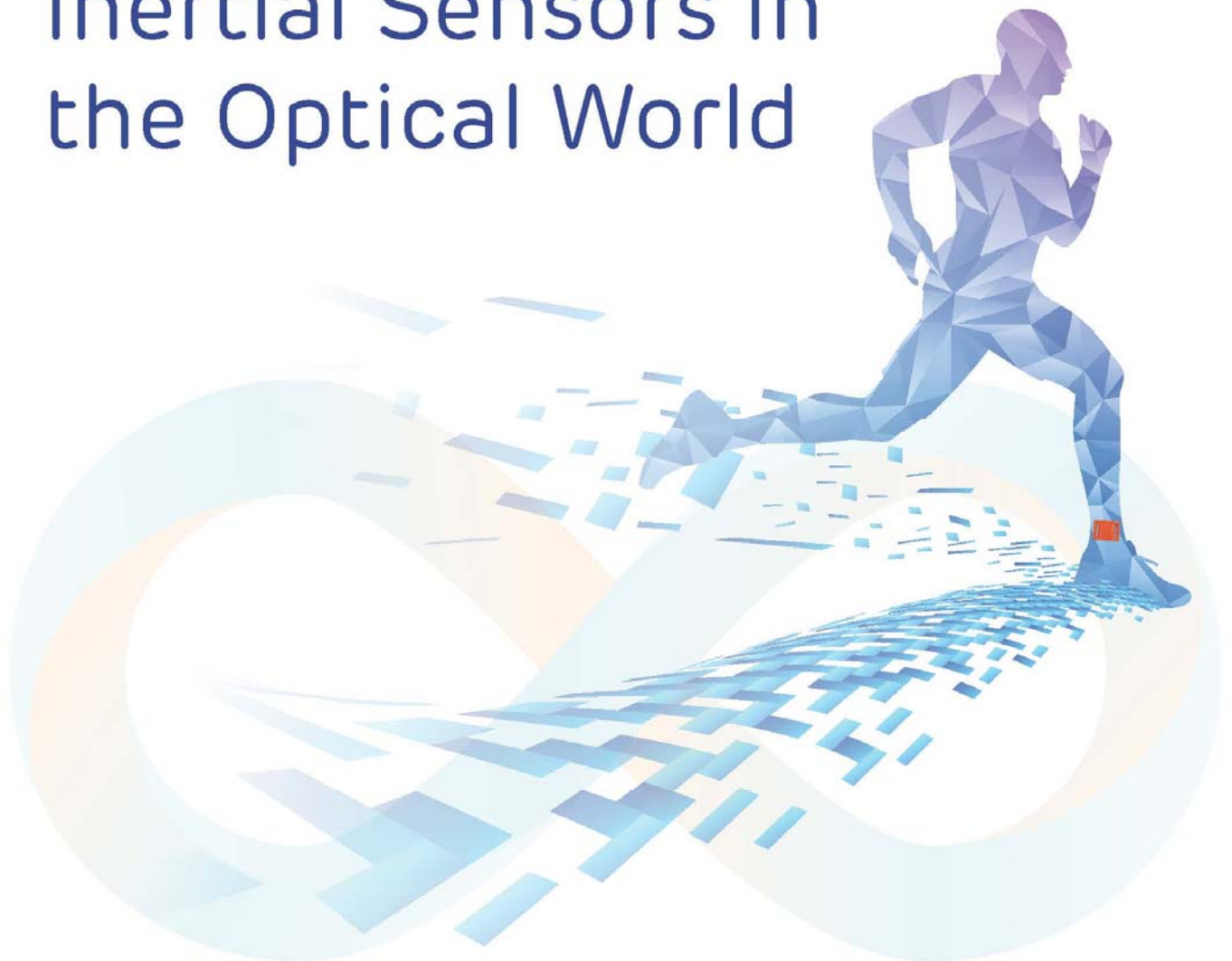


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CO-CHAIR EXPERIENCE—meet some of the student co-chairs

An initiative of the conference was to provide co-chair opportunities for students and academics. SPRINZ PhD student **Dustin Oranchuk** has coordinated the co-chairs.



Enora Le Flao: In addition to being the ISBS 2018 Secretary, Enora is earning her PhD in sports-related concussion, focusing on head impact biomechanics. Originally a mechanical engineer, she has previous experience in sports biomechanics, epidemiology and design of protective equipment.



Adrian Rodriguez Rivadulla: After obtaining my MSc and BSc degrees at the University of A Coruña in Galicia (Spain), I moved to the UK with the support of an Erasmus+ scholarship. I spent 6 months as an intern within the Department for Health at the University of Bath. Whilst there, Dr. Ezio Preatoni and I were awarded an ISBS Internship Grant 2017 to complete a study on focus of attention, coordination and motor learning. I then joined the Sports Surgery Clinic (Dublin, IE) where I currently work as Biomechanics Research Assistant. Our lab sees around 14 patients a day (mainly ACLR, athletic groin pain, AC joint injuries and concussed athletes), who provide us with an outstanding source of data for research. The different departments at the SSC collaborate in multiple research projects addressing injury related questions. At the moment, we are trying to assess whether healthy and athletic groin pain athletes use the same movement strategies through implementation of machine learning algorithms.

Alyssa-Joy Spence: Alyssa has just begun her PhD in Strength and Conditioning. She plans to blend her background as a yoga instructor and her love of powerlifting together to learn about the relationship between strength and flexibility in strength athletes.



Casey Watkins: Hello! I'm just a California native that found her way to studying sport science at California State University, Fullerton. After getting the opportunity to coach, train, and research a myriad of athletes, I moved across the pond to New Zealand to pursue a PhD in Strength and Conditioning for Rugby athletes. My research is centred around force-velocity expression, speed and power training, and load manipulation in Rugby.



Eric Harbour: Eric is currently working on a Masters project in biomechanics and performance analysis within Kayak sprint at AUT SPRINZ. He has a background in sports medicine and strength & conditioning within alpine ski racing and Rugby.

research aims to advance current clinical practice to improve recovery outcomes following concussion.

Joshua McGeown: In addition to being the ISBS 2018 Conference Student Coordinator, Josh is earning his PhD in sports-related concussion, focusing on improving rehabilitation. Josh previously worked clinically with concussed patients and his



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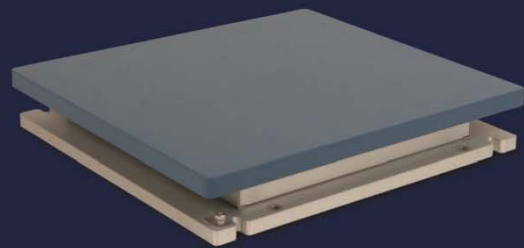


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ISBS 2018 AUT MILLENNIUM TEACHERS DAY—MONDAY 10TH

Dr Sarah Kate Millar is coordinating the New Zealand Biomechanics Teachers Day.

Dr. Kim Hébert-Losier is a Senior Lecturer in Applied Biomechanics and Injury Prevention at the University of Waikato. Kim is an experienced researcher in human movement, muscle function, 3D motion analysis, and injury prevention and screening in recreational to Olympic-level athletes. Current research projects include investigating long-term consequences of anterior cruciate ligament injuries, screening and preventing injuries in badminton and netball players, exploring the effect of kinesiology tape on elite cyclists, and understanding the individualization of running patterns.

<https://www.waikato.ac.nz/homeofcycling/about-us/our-people/kim-hebert-losier>



Dr Laura-Anne M Furlong is a Lecturer in Biomechanics, currently based in the School of Sport, Exercise and Health Sciences at Loughborough University, and the National Centre for Sports and Exercise Medicine. Her research focuses on understanding the links between muscle function, movement and control during walking and running activities, using a combination of non-invasive in vivo measures of muscle and tendon behaviour and structure with biomechanical analyses of movement, forces and coordination. <http://www.lboro.ac.uk/departments/ssehs/staff/laura-anne-furlong/>

Dr Philip Fink is Senior Lecturer in motor control and biomechanics at the School of Sport, Exercise and Nutrition at Massey University. Phil's Current research topics include: 1) Studying the relationship of learning of finger sequence patterns and the symmetry properties of those patterns. 2) Using multifractal analyses to study static balance in children with obesity, with the goal of identifying the cause of balance dysfunction. 3) Studying the biomechanics of mountain biking, particularly the sources of resistance and the effects of vibrations. And 4) Examining how beat is perceived in music.

<http://www.massey.ac.nz/massey/expertise/profile.cfm?stref=413040>

Dr Dwayne Knudson is a Professor in the Department of Health & Human Performance at Texas State University. He does research in biomechanics of sport and exercise, learning biomechanics, application of biomechanics in qualitative diagnosis of movement technique, and research impact in biomechanics/kinesiology.

https://www.researchgate.net/profile/Duane_Knudson



Suzie Belcher is currently working with Netball New Zealand as part of their national Injury prevention team, NetballSmart. Suzie is originally from Lincolnshire in the UK; prior to moving out to New Zealand Suzie spent 5 years as a qualified physiotherapist. There she was able to work for the government run program TASS (Talented Athletic Scholarship Scheme), helping National Athlete's gain Olympic status whilst staying in education, based out of Sheffield Hallam University, UK. Alongside completing her MSc in Sport's Injury Management and Therapy. Since being in New Zealand Suzie now 9 years qualified as a physiotherapist has been able to continue her work with international athletes from the UK and NZ, in Winter and Summer sports up to Olympic/Paralympic level. Suzie has worked mainly in the Private Sector as a Clinic Manager and Sport team Specialist, as well as with National Sports groups. Suzie has been working with her clinics as an Educational and Professional Development lead, building up workshops in advanced sports taping, massage, acupuncture use in sport and biomechanical correction of gym exercises. Suzie is also a PhD candidate at SPRINZ.



SPRINZ SPORT AND EXERCISE BIOMECHANICS TEACHING ARCHIVE LAUNCH

Prof Duane Knudson, Dr Anna Lorimer, Prof Patria Hume and Kelly Sheerin

The host of the archive is the *J.E. Lindsay Carter Kinanthropometry Clinic and Archive (JELCKCA)* at the Auckland University of Technology. The Director of the Archive is Professor Patria Hume (AUT SPRINZ), the Deputy Director is Mr Kelly Sheerin, and archive web master is Dr Anna Lorimer (Bond University and AUT SPRINZ). Prof Duane Knudson is the leader of the new Sport and Exercise Biomechanics teaching component of the archive. Initiation of this project was a result of planning and hosting the 36th Annual Conference of the International Society of Biomechanics in Sports (ISBS) in Auckland, New Zealand September 10-14, 2018.



This archive is a place to share (upload) and obtain (download) electronic image files that are intended for non-profit instructional use in sport and exercise biomechanics classes and educational outreach programs (e.g. National Biomechanics Day). Archive images are intended to be stand-alone instructional slides or can be photo/images/graphics that illustrate biomechanical data, principles, theories, or application. While human sport and exercise examples are preferred, any animal biomechanical images of potential interest and instructional value are welcome. Images in the archive are organized into the following *thirteen categories* to facilitate user access: *Active Learning Experiences, Applications in Professions, Core Concepts, Data Collection, Demonstrations, EMG/Neuromuscular, Fluids, Kinematics, Kinetics, Muscle Mechanics, Theories, Videos, and Other*. Users of archive need to register .

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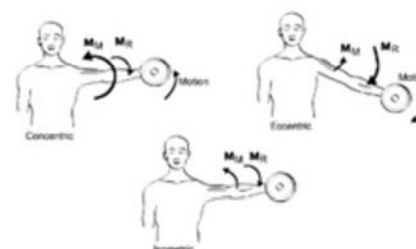
Uploading Expectations

Please upload only standard, widely supported electronic image (.jpg, .png or .gif) or short, compressed video files (.avi, .gif, .mov, .mpeg). Please strive to use a wide, horizontal layout common in MS PowerPoint slides (vertical to horizontal ratio of 1:1.9). Sources of all published data should be cited in APA format (Author, year). ALL slides should also identify the person submitting the slide on the bottom, lower left. We recommend the following format for this acknowledgement: *Slide by First Initial. Slide Author Surname for educational use only*. All uploads require the entry of the name and email address of the person that created the submission, along with a few suggestions describing the potential use of the image-slide. Please use a filename that is descriptive of the image-slide content (e.g., MuscleActions.jpg).



Muscle Actions

- **Muscle Action**—neuromuscular activation of muscle contributing to movement or stabilization
 - **Isometric:** Moment of force of muscle or muscle group (**active** and **passive** components) is equal to the moment of the resistance—negligible joint motion
 - **Concentric:** Muscle moment is larger than the moment of the resistance—whole muscle shortens
 - **Eccentric:** Muscle moment is less than the moment of the resistance—whole muscle actively lengthens, essentially acting as a brake



Slide by D. Knudson for educational use only

Knudson (2003)

AUT MILLENNIUM APPLIED PROGRAMME UPDATE

During the AUT Millennium applied sessions you will get to meet two rowing coaches. Both coaches have been part of RNZ, Sport NZ and HPSNZ coach development programmes.



Ian Bright, Auckland Rowing Performance Centre Head Coach

Ian is originally from Canada and moved to NZ in 2009. Ian's first coaching role in NZ was assisting with Auckland Grammar Rowing, before taking on the Head Coach Role after 3 years. During this time he also coached the NZ U18, U21 and Junior rowing team. In 2016 Ian took on Sacred Heart as the Head Coach but after one year with the school and another successful NZ junior campaign, Ian was then selected as assistant coach for Auckland Rowing Performance Centre (RPC). In July 2018 Ian was promoted to Head Coach for the Auckland RPC.



Aimee Pink, Auckland Rowing Performance Centre Assistant Coach

Aimee grew up in Hamilton and began coaching rowing at Hillcrest High School when she finished school. After a couple of successful years with Hillcrest, Aimee made the move to Auckland to become Head Coach of Baradene College. During this time Aimee coached NZ U18s and U21s and has been involved with a number of Auckland development teams. In July 2018, Aimee was selected as the new assistant coach for Auckland Rowing Performance Centre, a role she has only just started.

We thank the national sports who have agreed for their high performance sport scientists, athletes and coaches to be involved in the ISBS 2018 Auckland conference.



As an athlete **Mike Schofield** started out as an elite golfer and then onto Olympic weightlifting which sparked an interest in power based sports. Blending the two passions Mike moved onto a masters in rotational power development and starting working as a strength and conditioning coach for throwers, golfers and weightlifters. Following the completion of a masters and still having some unanswered questions Mike moved through to a PhD in throwing biomechanics, strength and conditioning and how to blend the two under the supervision of Prof. John Cronin, Dr Kim Herbert-Losier and Dr Angus Ross. Currently Mike is mid-way through his PhD Mike and works with elite throwers as an applied biomechanist, strength and conditioning coach and coach.

AUT DIGITAL TECHNOLOGY UPDATE



POSTER presenters note: All ISBS posters will be presented digitally, on large 55" Samsung screens. Use A0 poster size, 841 x 1189 mm, portrait format.

You can insert video into your posters to showcase your methods. A poster template is available on the conference website.

For advice on technical specifications contact Dr Jono Neville <jono.neville@aut.ac.nz>.



Video formats: We recommend posters are submitted using embedded video files using formats supported by Microsoft PowerPoint: avi, mp4, mov, mpg, wmv. We can not guarantee video formats outside of these will operate as intended. Embedded videos should be set to play automatically and loop continuously to enable continued display throughout the day.



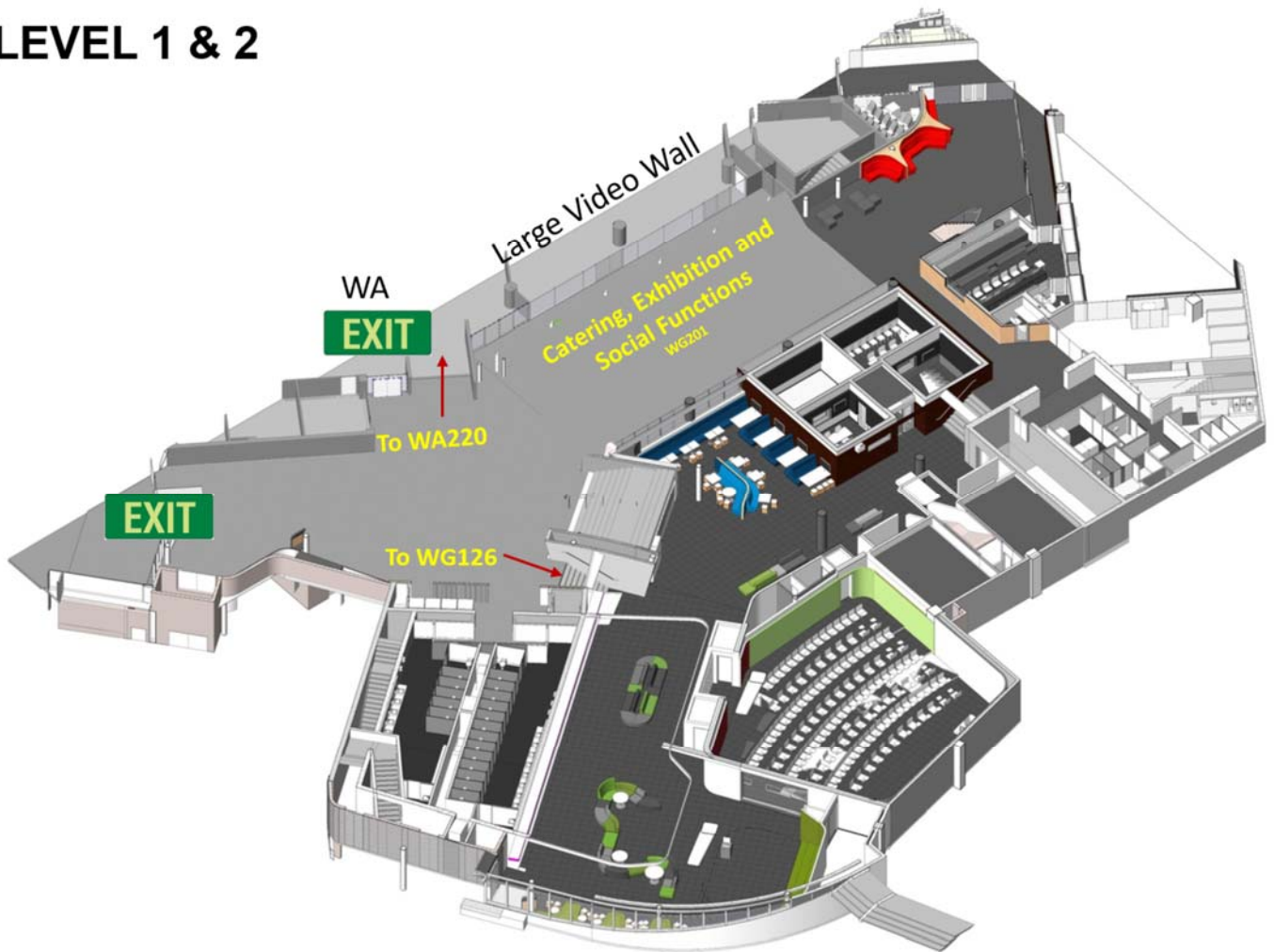
CO-CHAIR ASSOCIATE PROFESSOR JACQUELINE ALDERSON IS IN NZ

Associate Professor Jacqueline Alderson arrived in Auckland to work on the final edits of the proceedings for the conference. Staying at Patria's family bach at Kawau Island, Jacque took some time out to catch a snapper fish.

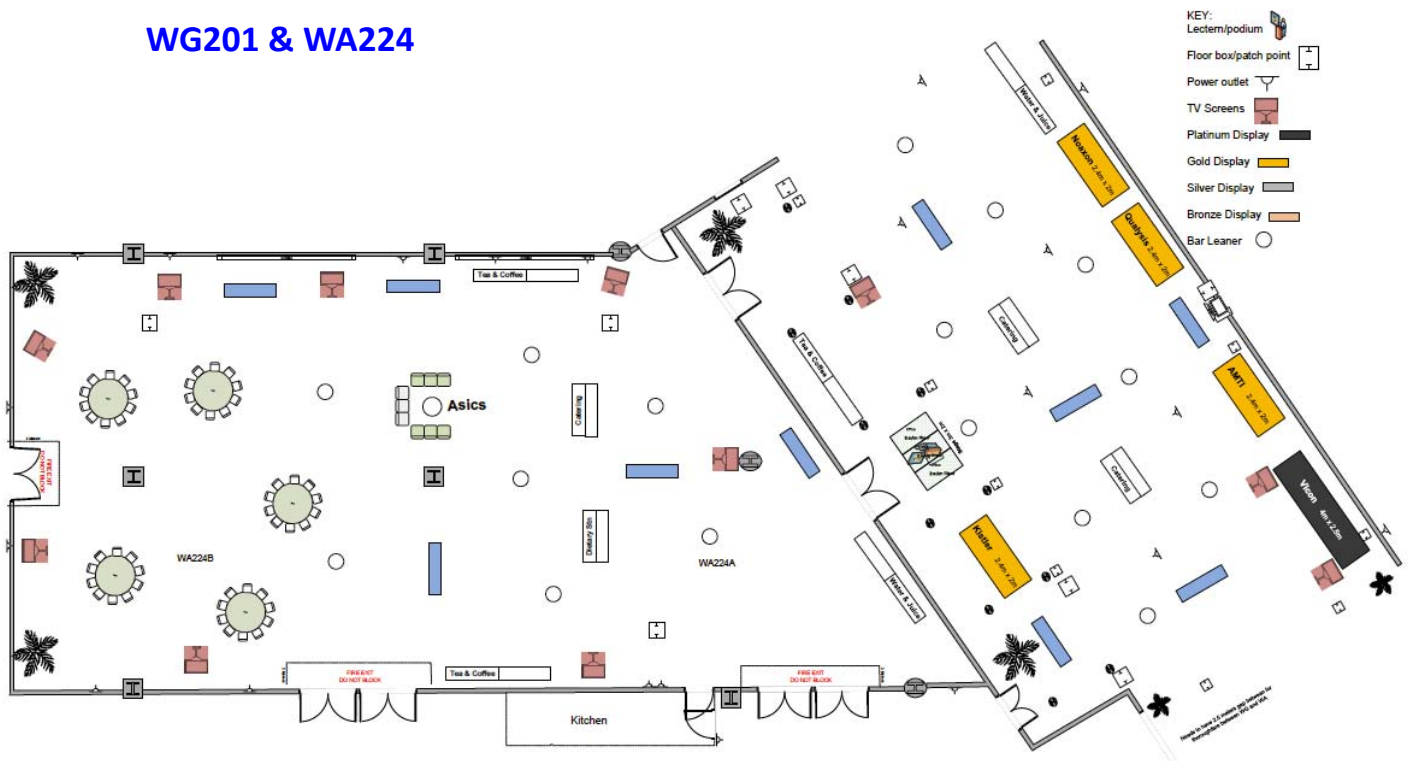


FLOOR PLANS LEVEL 1 AND 2

LEVEL 1 & 2

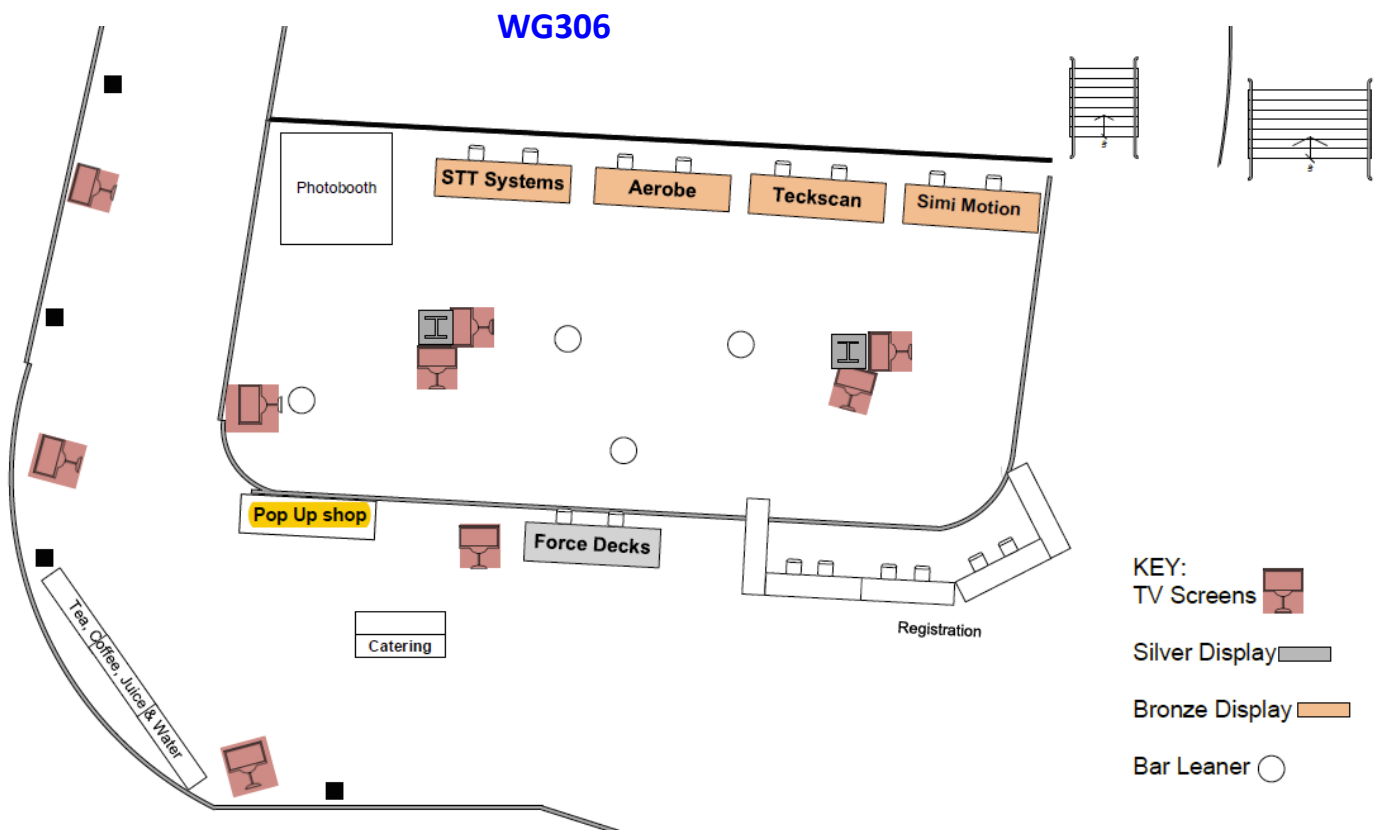
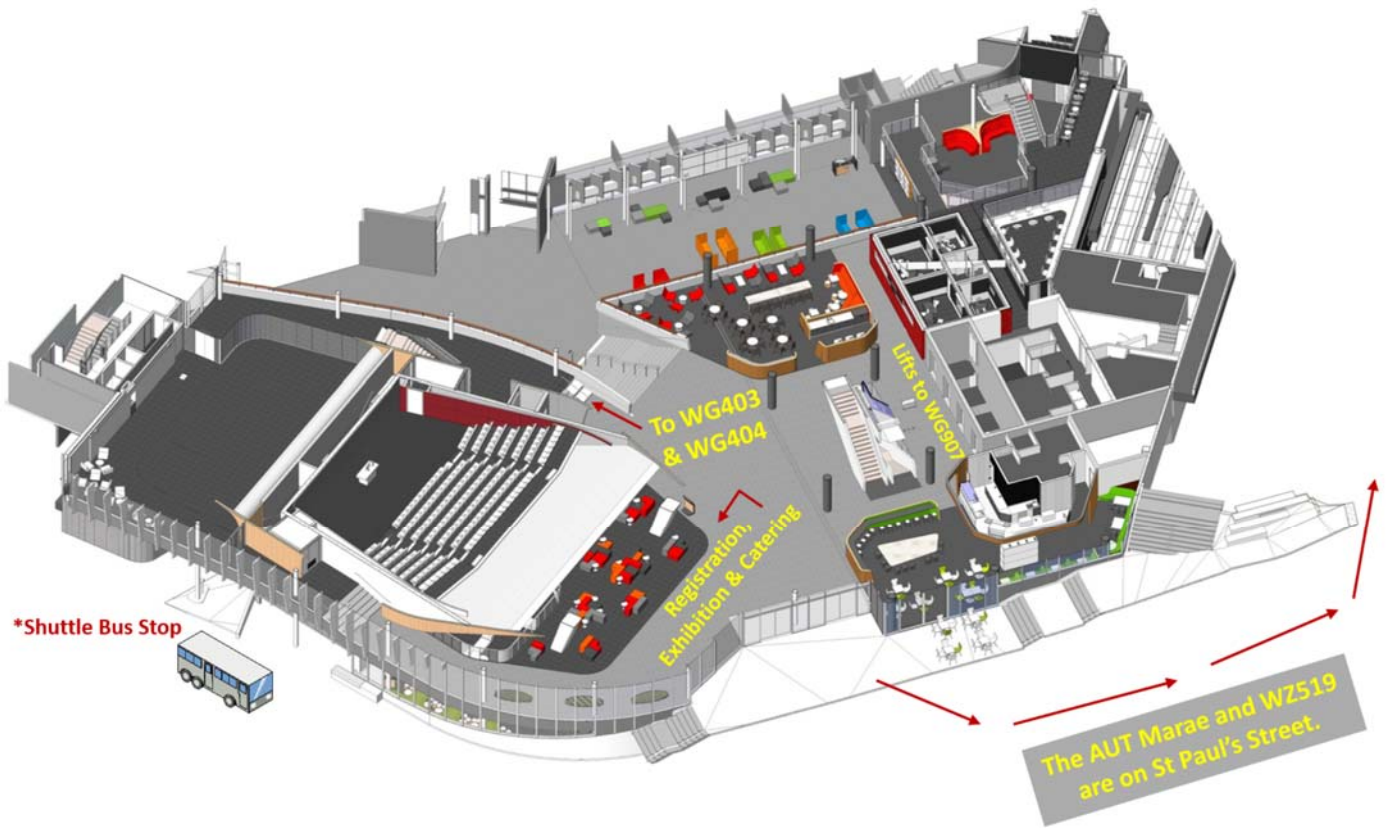


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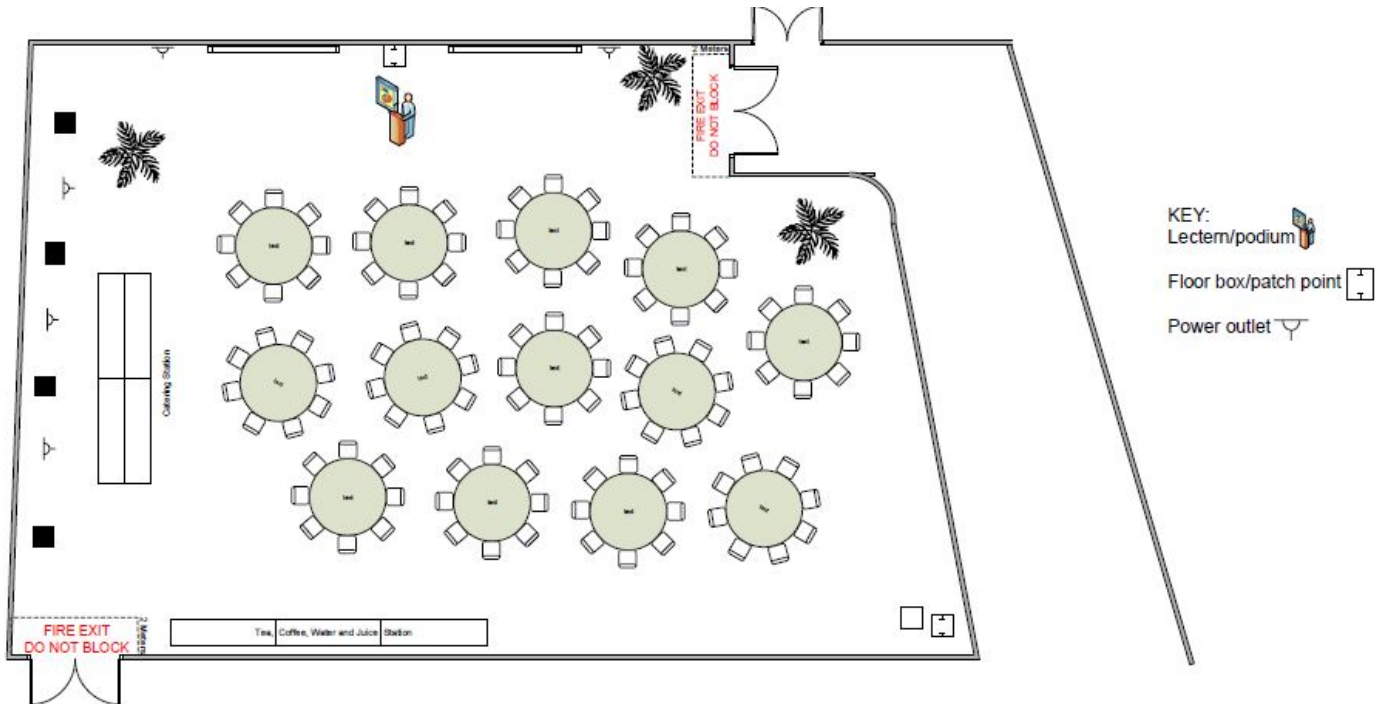
FLOOR PLANS LEVEL 3

LEVEL 3

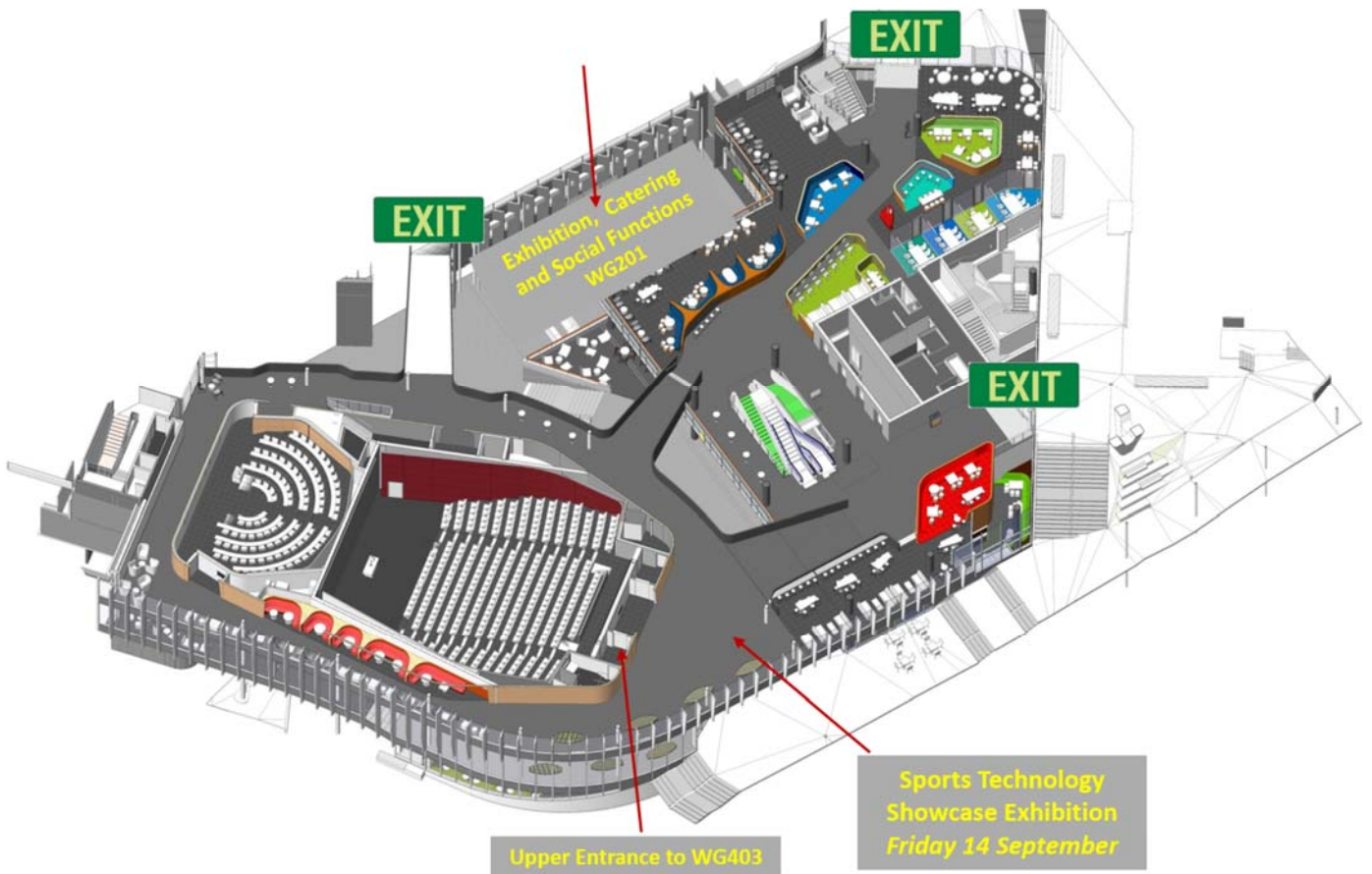


FLOOR PLANS LEVEL 3 AND 4

WG308



LEVEL 4



ISBS 2018 CONFERENCE INDUSTRY PARTNERS AND HOSTS



VICON are providing the blue ISBS 2018 conference puffer jackets to those who registered by the standard registration date. Vicon are also providing beverages for conference events.



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SILENI are providing amazing wines for all the conference events. We have a large selection from the Sileni range including Marlborough Sauvignon blanc, pinot gris, pinot noir, sparkling cuvee brut, merlot etc.

SAMSUNG are providing new FLIP technology screens and 55" screens for the digital poster sessions.



KISTLER are supporting two round table luncheons, and Olympic athletes at the AUT Millennium event. QUALISYS and NORAXON are providing workshops and AUT Millennium applied sessions. AMTI are providing chocolate box stations and support of the student evening at the marae. ACC is supporting the ACC Keynote panel speakers and a round table luncheon. Force Decks are supporting the Commercialisation and funding Monday workshop.



CHANUI are providing tea and biscuits. AEROBE are supporting the Wise Wizards Keynote Panel. TEKSCAN are supporting the sports technology long table luncheon. STT Systems are supporting the fruit baskets. Asics are providing shoes for prizes and a Chill out zone. SIMI are a bronze industry partner.



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