Message from the President

Randall Jensen

Greetings ISBS members,

Another successful conference has recently been held, although this one was different than most others. Wayne and his colleagues in Canberra did a fantastic job of adapting to the many changes that were necessary to put on a first-rate conference. They kept everyone connected across numerous time zones and have provided the sessions online for members to view. I encourage you to go to the new ‘Videos’ section of the society website (after signing in) to view the sessions you were unable to attend, or to watch them again to see what you may have missed the first time around. Recordings from previous online events are also available, as detailed on page 26 of this newsletter.

In addition to the regular conference, this past year saw the highly successful inaugural Mid-Year Symposium being held. Planning for the second one, which will take place online 2nd - 3rd February 2022 and again be free to ISBS members, is currently underway. A related update from VP of Conferences and Meetings, Tim Exell is on page 5 of this newsletter.

This past year has seen development of a number of initiatives, brought forward by Duane Knudson as President, further details of which are provided elsewhere. A major proposal has been a Code of Conduct; related to this is the creation of an Diversity, Equity, and Inclusion Committee. Details of the committee can be viewed on page 4.

This year has also seen changes in the Executive Council of ISBS. As well as Duane Knudson moving from President to Past President, Silvio Lorenzetti has stepped down from Treasurer and Sarah Breen as VP of Publications.

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Stephanie Moore
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Message from the President
Randall Jensen

All three of these individuals have provided a huge service to ISBS over the years and I cannot thank them enough. Marcus Lee and Stuart McErlain-Naylor have stepped up to take over the Treasurer and VP of Publications roles, and I know both will do an excellent job. I’d also like to thank Sina David, Yasushi Enomoto, Laura-Anne Furlong, Mitsuo Otsuka, and Shinji Sakurai for their service as Directors; as well as welcome Evan Crotty (Student Director), Johannes Funken, Hiro Hobara, Stuart McErlain-Naylor, Gretchen Oliver, and Elaine Tor to the Board. Remember, the Board of Directors represents its members, and our Society is only as strong as its members. So, we encourage you to reach out to the Board with your concerns and suggestions.

One of the big reasons I’ve enjoyed ISBS for so many years is the contacts made at conferences over the years. Hopefully, things will have settled down by next July and we can all meet in person again in Liverpool. All the best and stay safe.

Randall Jensen
ISBS President
ISBS Code of Conduct

Duane Knudson

At the 2021 post-conference meeting the ISBS Board adopted a Code of Conduct and policy for ISBS members. The policy is an initial step to formalize our commitment to collegial, open, and harassment-free exchange of scientific ideas in all ISBS activities. Reporting and due process review of potential violations of the policy will go through conference organizers or any Executive Council members. You can download and review the policy on the society website here.

Diversity, Equity, and Inclusion Committee

President Randall Jensen has also established the inaugural ISBS Diversity, Equity, and Inclusion Committee that will work on updates to this policy. Another main purpose of this committee is to explore more formal expression and implementation of our society values and policies in promoting inclusion of diverse perspectives from world sports biomechanics populations. The committee is chaired by Past-President Duane Knudson and includes several ISBS members from around the world. If you would like to provide input on this initiative contact any of the following committee members: Felipe Capres, Floren Colloud, Steffi Colyer, Sina David, Ina Janssen, Hashem Kilani, Kristof Kipp, Duane Knudson, Marcus Lee, Stephanie Moore, or Hannah Wyatt.

Post-Conference Report: Canberra, 2021

Wayne Spratford

ISBS 2021 Canberra, was hosted virtually as a partnership between the University of Canberra and the Australian Institute of Sport. The conference attracted 468 registered delegates, seven sponsors and over 100 abstracts. The scientific programme was held over three distinct timeslots to make it possible for the majority of time zones to see two sessions live, with all recordings uploaded to the society’s YouTube page daily. The programme offered six key note lectures, six panels/workshops as well as giving sponsors and exhibitors the opportunity to showcase their technology in standalone slots.
The conference committee would like to thank all Session Leaders: Walter Herzog, Raihana Sharir, Lisa MacFadden, Kristof Kipp, Stephanie Moore, Danielle Trowell, Ezio Preatoni, Sophie Burton, Laura-Anne Furlong, Cody Lindsay, Crystal Keen, Neil Bezodis, Monique Mokha, Joel Fuller, Kane Middleton, Bill Johnson, Pablo Floria and Jodie Wills. We would also like to again thank and acknowledge our sponsors, Vicon, Simi, Amti, Xsensor, IMeasureU, Logemas and Qualisys. On a personal note, I would like to thank Ina Janssen, Sarah Breen, Tim Exell and Neil Bezodis for their patience and support in the lead up and during the conference.

On behalf of the organising committee, we look forward to seeing you all in person for Liverpool 2022.

2nd Virtual Mid-Year Symposium 2022

Tim Exell

A reminder that we will be hosting the second Mid-Year Symposium on 2nd-3rd February 2022. This event builds on the huge success and positive feedback from ISBS members on our inaugural Mid-Year Symposium that took place in February 2021.

The symposium will again incorporate a number of different session themes and formats that will be presented across varying time zones to accommodate ISBS members from around the globe. As well as research and applied biomechanics focussed events suggested by ISBS members, events will also include a students’ event and mother’s café. All events will be free and available to all ISBS members. Please ensure that your membership is current to participate and register. Unsure of your status (remember that memberships expire at the end of December!)? Check your membership status on the ISBS website.
ISBS Awards 2021

Neil Bezodis, ISBS Vice-President (Awards)
Swansea University, UK

The following awards were presented as part of the online conference in September 2021.

Geoffrey Dyson Award

The Geoffrey Dyson Award and Keynote Presentation is the most prestigious award offered by ISBS. It is awarded to an individual who through their professional career has embodied and carried out the primary purpose of ISBS; to bridge the gap between researchers and practitioners.

The award is named after one of the founding figures of Sports Biomechanics, Geoffrey Dyson. Geoffrey Dyson had a long and strong academic and coaching career. He was the coach of the British Olympic Team in 1952, 1956, and 1960. In 1962, he first published his book on the Mechanics of Athletics. He was a speaker for the International Olympic Academy and conducted athletic courses in 14 countries. According to John Disley, one of Geoffrey Dyson's favourite pupils, “he devoted his life to making coaching a science and to exposing the charlatan whose only effective advice was do it again, but harder”.

The 2021 recipient was Senior Professor Julie Steele from the University of Wollongong, Australia. Senior Professor Steele delivered a very engaging, inspiring, and thought-provoking keynote presentation (available on the website) focussing on the lessons she has learned during her long and distinguished career in sports biomechanics. It was clearly very well received by many within the society, particularly some of the younger and early career members based on the feedback provided during and after the presentation. Keep an eye out for Senior Professor Steele’s forthcoming article in Sports Biomechanics which will elaborate on parts of her Dyson Award lecture.
**ISBS Awards 2021 (cont.)**

**Neil Bezodis**

It was announced during the 2021 Online Conference that the 2022 Geoffrey Dyson Award Winner will be **Professor João Paulo Vilas-Boas from the University of Porto, Portugal**. We all look forward to hearing Professor Vilas-Boas’ Keynote Presentation next year.

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**Fellows**

The ISBS Fellow award recognises substantial scholarly and service contributions to ISBS and Sports Biomechanics. Fellowships were awarded this year to (below, from left to right, top row then bottom row) **Dr Helen Bayne** (University of Pretoria, South Africa), **Prof. Floren Colloud** (Arts et Métiers Institute of Technology, France), **Dr Steffi Colyer** (University of Bath, UK), **Dr Ina Janssen** (Sportcentrum Papendal, Netherlands), **Dr Marcus Lee** (Singapore Sport Institute, Singapore), and **Dr Gillian Weir** (New York Yankees, USA). Congratulations to all of our new ISBS Fellows!
ISBS Awards 2021 (cont.)

Neil Bezodis

Hans Gros Emerging Researcher Award

The Hans Gros Emerging Researcher Award recognizes excellence in early career research. This prestigious award is given annually to an individual who has excelled in their early research career (2-5 years post-PhD) and has embodied the ISBS philosophy of applied science and ‘bridging the gap’ between research and application in practice. The Hans Gros Emerging Researcher Award was first awarded in Taipei, Taiwan as part of the 31st ISBS conference. The winner is invited to present a lecture on their research at that year’s ISBS conference.

The award was named to commemorate Hans Gros for his contribution to ISBS. Hans Gros was a founding member of ISBS and was President in 1996-1998. Hans established the first ISBS website and was awarded Life Membership in 2001 in San Francisco. He was a faculty member at the University of Stuttgart in Germany and taught biomechanics, skiing, and track and field. His research interests focused on sports equipment design for gymnastics, archery, and the biomechanics of track and field.

This year’s recipient was Dr Gregory Tierney from the Ulster University, Northern Ireland, who delivered an excellent presentation (available on the website) entitled Concussion biomechanics and head acceleration exposure in sport which gave a thorough overview of the current state of his and others’ work in this very topical area. Don’t forget to look out for Dr Tierney’s forthcoming article in Sports Biomechanics which will focus on this as part of his award prize.

Dr Gregory Tierney
Ulster University, Northern Ireland
After a one-year hiatus, the New Investigator Award returned in 2021 and it was incredibly competitive. Congratulations to all of the new investigators who were shortlisted to the poster and oral finals and presented their work as part of these at the 2021 Conference. The judges commented on the high quality of the research and the presentations, and stressed how challenging a decision it was not only to select the winners, but also the top 3 for each category! You can watch all presentations here. Congratulations to all of our winners who are listed below:

**Oral Presentation Winners**

1. Simon Augustus (Kingston University & University of Chichester, UK)
2. Sam Zeff (University of Massachusetts, Amherst, USA)
3. Corey Morris (University of Western Australia, Australia)

**Poster Presentation Winners**

1. Tsuyoshi Iitake (Fukuoka University, Japan)
2. Amane Zushi (University of Tsukuba, Japan)
3. Hunter Frisk (Lakeland University, USA)

**ISB World Athletics Award for Biomechanics 2022**

The International Society of Biomechanics (ISB) recently developed a partnership with World Athletics and established the **World Athletics Award for Biomechanics** which was first given at the ISB conference in 2021. ISBS have been invited to host this award in years when the ISB conference is not held, and only papers submitted to the ISBS annual conference will be eligible for consideration.

After focusing on running-related research in 2021, the World Athletics theme for 2022 is **throwing-related research**. If you are conducting research in throwing biomechanics then please consider submitting your work for the 2022 ISBS Conference and applying for this exciting new award. Further information about applying will be circulated nearer the paper submission deadline, and some is also available on the ISB website.
In July 2020, amidst the Covid-19 pandemic, I was awarded the ISBS Student Research Grant to support my research entitled “Head impact sensors during sparring: differences and similarities between mouthguards, patches and headgear sensors”. I was fortunate New Zealand stayed relatively Covid-free, so I was able to conduct my study and complete my PhD thesis.

Head impact sensors have been used for two decades to measure skull kinematics, which are assumed to be associated with brain strains and mild traumatic brain injuries. Such sensors typically consist of accelerometers and gyroscopes embedded in headgear, adhered to the skin, or moulded into a mouthguard. However, the movement of the sensor relative to the skull affects the accuracy of head kinematics and is accentuated *in-vivo* because of the characteristics of the interface between the sensor and the skull (e.g., hair, skin, sweat, poor fit on dentition). This research project was designed to record head acceleration events using three sensors simultaneously, representing three types of coupling to the skull: an instrumented mouthguard, a patch attached to the skin and a patch attached to the headgear. The aims were to (1) compare the three sensors in terms of the number of acceleration events recorded relative to events observed on video; (2) assess the quality of the raw kinematic traces for each sensor; (3) compare the peak accelerations across sensors.

This observational cohort study followed seven competitive boxers during weekly sparring sessions. Each participant was equipped with the three sensors (Figures A-C) and sparring was filmed using several cameras (Figures D-E). Videos from 115 rounds of 3 minutes were reviewed to identify every contact to the participants’ head and body. Acceleration events recorded by the sensors were matched to video events and the number of true and false positives were analysed. Next, using only video-verified events, we appraised the quality of the raw kinematic signals. Finally, for those events that met our quality criteria, we analysed the peak accelerations.

Several unexpected results emerged: the rate of false-positive events was surprisingly low (< 1%); the skin and headgear patches recorded similar numbers of events and twice as many as the mouthguards. Large proportions of events (50-80%) contained measurement issues, suggesting that the kinematic data, particularly from the patches, often reflected the motion of the sensor itself rather than the motion of the head. Such events were associated with higher peak accelerations. For high-quality events, there was little to no association in peak accelerations between the three sensors. These results led to the conclusion that extreme caution must be used when analysing kinematics measured with head impact sensors, and we were able to make methodological recommendations for future research.

I am truly thankful for the ISBS support, which has been instrumental in achieving the high-standard research I was aiming for. I look forward to presenting my results to the ISBS community in more detail: keep an eye out for a presentation in 2022!
Glenn Fleisig, PhD, American Sports Medicine Institute (ASMI)

Student Intern: Jasper Bishop, University of South Carolina

Thanks to the ISBS scholarship, Jasper was able to join the American Sports Medicine Institute for the summer of 2021, focusing on their project comparing the use of marker and marker-less automated motion capture systems for the measurement of baseball pitching kinematics.

Baseball pitching is one of the most complex biomechanical movements recorded in athletics. Its mixture of sequential joint motions, high rotational velocities, and maximal joint kinetics make it the perfect candidate for utilization of 3D motion capture. Automated optical tracking of reflective markers has been the “gold standard” in baseball biomechanics for over 30 years, however this method is limited in utility outside of a laboratory setting. Recent breakthroughs in computer vision technology have led to the emergence of marker-less methods for tracking 3D motion. The potential of this new technology is tremendous, allowing for biomechanics to venture out of the laboratory and onto the playing field. While several marker-less systems are now commercially available, very little is known about their accuracy or comparison to marker-based systems for baseball pitching. Thus, this study sought to compare baseball pitching kinematic data captured using a marker-less motion capture system against that of a marker-based system.

An abstract for this project was accepted to the ISBS 2021 Conference. In this study, nine individuals threw a total of 114 pitches from an indoor mound meeting all Major League Baseball specifications. Each pitch was simultaneously captured using a 12-camera marker-based system and a 9-camera marker-less system at 240 Hz. Data were time-synchronized between the two systems using the frame at which ball release occurred. 18 kinematic measurements identified by ASMI as key pitching performance indicators were compared between the two systems using paired t-tests. Coefficient of Multiple Correlations were calculated for eight of these kinematic variables across a time series spanning from 200 frames before ball release to 10 frames after ball release.

CMC values ranged from 0.90 to 0.99 for each time series, suggesting excellent agreement between the shapes of each curve. Significant differences were seen (p < 0.05) across a majority of the kinematic measurements, suggesting systematic differences between the marker-less and marker-based technologies. Architectural differences in how joint centers are calculated for each system likely influence the magnitude of their differences. Despite these differences, the similarities in the shape of the overall time series suggest that marker-less motion capture systems may still provide value to clinicians and coaches. However, based on the variations between systems it is recommended that a database of normative ranges should be established for each system individually.

An undergraduate student, Jasper plans to use the knowledge and experience gained through this opportunity as he completes his senior thesis. He looks forward to pursuing a graduate level degree in biomechanics and hopes to apply these skills in the growing field of sports biomechanics. Both Jasper and the American Sports Medicine Institute are incredibly grateful for this internship grant and the value which it provides for young and aspiring biomechanists.
ISBS is pleased to announce that the Student Research Grant, Internship Grant and the Mobility Grant will all be available in 2022! These grants have been developed to support the research activities of ISBS members. Brief information relating to all three grants are provided over the next two pages. Full details of the grants and application processes are available under the ‘Grants’ tab of the website: www.isbs.org/grants. Please note that the deadline for all applications is April 15 2022.

### Student Research Grant

The Student Research Grant is open to final year undergraduate students and postgraduate students and is available to fund biomechanics research projects in an environment that provides strong mentorship from an established researcher. The grant is designed to assist the student in the early stages of their professional development to encourage the pursuit of biomechanics research.

**Funds Available**

ISBS funds up to two awards per year, each award may be up to €1000 and is available to fund research for up to one year in duration.

Applications in one or more of the following areas are encouraged:

- Sports / Exercise biomechanics
- Paediatric/ gerontology exercise biomechanics
- Development of biomechanical methods/ instrumentation
- Fundamental movement biomechanics
- Sports engineering
- Biomechanics of injury prevention and rehabilitation in sport / exercise

**Eligibility**

The applicant and the established supervisor must be current ISBS members.

The student’s supervisor is expected to administer the funding.

Students must be enrolled as a final year undergraduate or a graduate student at the time of application.
Call for Applications: ISBS Research Grants 2022 (Cont.)

Internship Grant

The Internship Grant will provide funds to pay an intern student to assist with the research of a full ISBS member (who has been a member of ISBS for three consecutive years). The purposes of the internship are to: 1) support full ISBS members (particularly early career researchers) in their research activities by providing student internship support and 2) foster the intern student’s interest in biomechanics research and provide them with an opportunity to become familiar with research techniques and collect data under the guidance of an established researcher.

Funds Available / Allowable Costs

The amount paid will be €250 per week for students living away from home or €150 per week for students living at home for 4-8 weeks and is administered by the Host Institution. Other research expenses are not payable.

Duration / Eligibility

Projects should be achievable in 4-8 weeks – students should be working on a specific project and details of what is intended to be achieved within the time frame is required at application. Students should currently be enrolled as an undergraduate or taught masters student (PhD students are not eligible as intern students).

Early Career and Developing Researcher Mobility Grant

The Early Career and Developing Researcher Mobility Grant will provide funds to support full ISBS members to travel to an established ISBS member’s or applied organisation’s lab. Alternatively, when the applicant is unable to travel due to family obligations or medical reasons, this grant may be utilized to fund an ISBS full member to visit the applicant’s lab. The purpose is to allow the applicant to learn new techniques, collect data, develop research skills, bridge the gap between research and practice and build collaborative sports biomechanics networks. Visits may be to a research lab or applied organisation that utilises sports biomechanics (e.g. National Governing Body or footwear/ equipment manufacturer).

Funds Available / Allowable Costs

Up to €2000 each to support travel costs and accommodation/ subsistence. Full anticipated costings and details of other current financial support to be provided with application.

Duration / Eligibility

Visits are for a duration of 4-8 weeks. ECRs should be less than 3 years post-PhD graduation (not including verified absence due to sickness, maternity, paternity). Developing Researcher, >3 years post-completion of PhD.

Contact

Applicants must be a member of ISBS for three consecutive years.

Do you have a specific question to ask? Feel free to contact me at vpresearch-projects@isbs.org
Call for Papers: **ISBS 2022, Liverpool**

It is our pleasure to invite you to the 40th annual conference of the International Society of Biomechanics in Sports in Liverpool - the first time the conference has visited the UK. Liverpool is a wonderful small city, home to two cathedrals, the Beatles, a world-renowned waterfront, two football clubs, leading universities and more. The conference is hosted by Liverpool John Moores University in the city centre, and the conference dinner is in the Neo-Classical St George’s Hall. We have confirmed expert speakers and a diverse applied and social programme. We would love to welcome you to Liverpool in July 2022.

Dr Mark Robinson and Dr Mark Lake, conference co-chairs

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**Liverpool**

**Speakers**

- Prof. J. Paulo Vilas-Boas
  University of Porto

- Dr. Todd Pataky
  Kyoto University

- Dr. Emma Hodson-Tole
  Manchester Met. University

- Dr. Brent Edwards
  University of Calgary

and more...

Submissions invited for the New Investigator Award, Hans-Gros Emerging Researcher Award, Travel Grants

**Programme**

- **Call for papers in areas including:** Athletics, para-olympics, racquet/club sports, combat sports, water sports, injury, rehabilitation, cycling, football codes, strength & conditioning, muscle & tendon, modelling /simulation, equipment, imaging, wearable technology, teaching & learning, motor control, methods / statistics and coaching.

- **Pre-conference workshops:** SPM, user group meetings & more...

- **Indicative applied sessions:** Markerless MOCAP, Cycling, Rehabilitation, Gymnastics, Cricket, and more...

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**Key Dates**

- Abstract Submission Opens: 1 Dec 21
- Abstract Submission Closes: 21 Jan 22
- NIA Deadline: 31 Jan 22
- Hans Gros Award Deadline: 31 Jan 22
- Early Registration Opens: 21 Mar 22
- Author Notification: 8 Apr 22
- Travel Grant Deadline: 22 Apr 22
- Notification of Travel Grants: 29 Apr 22
- End of Early Registration: 6 May 22
- Conference: 19-23 Jul 22

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Proudly supporting the **Student Mentor Breakfast, Mothers Cafe** and a **Women in Sports Biomechanics** event

**Full details at** [https://isbs2022.org](https://isbs2022.org)
1st Call for Hosting ISBS 2025

Tim Exell VP Conferences and Meetings

1st call for hosting the 43rd Conference (2025) of the International Society of Biomechanics in Sports

The annual ISBS conference is a key-event for the international scientific exchange and networking within the field of sports biomechanics. At this time of the year, we are making the first call to ISBS members interested in hosting this attractive event in the year 2025.

This first call is open to interested ISBS members in the preferred region of Asia/Australasia.

If no proposals are received from the preferred region, a 2nd call for hosting will be made on the 1st of April 2022, opening the invitation to all global regions. The deadline for submission will then be 1st of June 2022.

Preparation of bid

If you are interested in hosting the 43rd ISBS conference in 2025, please prepare your bid according to the ‘Policy Manual for Planning and Preparation of the ISBS Annual Conference, which can be found at the ISBS website.

This document contains all relevant information to guide the preparation of a proposal to host the conference and information to help prepare and organise the ISBS Conference.

Submission of bid

Those wishing to submit a bid to host the conference in 2025 should submit the electronic file of the application to the VP of Conferences (vpconferences@isbs.org) by the 31st of March, 2022.
As part of the 2021 ISBS annual conference, a team of academics (namely Dr Sarah Breen, Dr ChengTu Hsieh, Dr Duane Knudson and Dr Mellissa Mache) delivered two interactive workshops centred around ‘Teaching Sports Biomechanics Using PBL’. The feedback from the attendees highlighted their enjoyment of the sessions and the vast benefits they got from them. Additionally, there was a really clear and strong public support for future sessions and opportunities to informally network with others working in teaching environments. Given we all know the difficulties faced when teaching biomechanics to sports enthusiasts we were really keen to support this. Thus, a small working group of ISBS members and officers was formed looking to develop an initiative focused on the teaching and learning aspects of sports biomechanics.

Get involved

Although it is only in the early stages, based on initial social media feedback we are hoping to facilitate informal online discussions to help with networking, idea sharing and problem solving as well as more formal presentations/workshops at the mid-year symposium and annual conference. However, we think it is most important that we focus the initiative on aspects that will interest and benefit you as members. Therefore, we have created a short anonymous survey to capture your thoughts on what activities you would like to be offered and the sessions that you think would be of most benefit. A second survey allows you to express interest in attending the sessions and provide contact details:

Please respond to these two short surveys by 28th November (you can still become involved / express interest after this date, but initial responses are required to aid session planning):

1. We welcome any ideas you have for activities, or indications of what you want to see involved in the initiative, by 28th November [form link]

2. We welcome all expressions of interest in participating in this group [form link]

Draft Schedule of Activities

Please note that this is subject to change based on the interests of members (see survey link above).

December - first informal discussion (see expression of interest form above)
February - Mid-year symposium session (teaching experiences during the pandemic)
March - National Biomechanics Day preparation
May - Novel biomechanics teaching methods (call for presentation volunteers)
July - Annual conference workshop and presentations (e.g. on the scholarship of teaching)

Informal drop-in chats to be arranged in-between across all regions.

If you have any questions then please don’t hesitate to contact one of us. We will communicate directly to everyone who expresses an interest as well as through the ISBS social media channels.

Dr Alexandra Atack, Dr Sarah Breen, Dr Stuart McErlain-Naylor and Dr Crystal Kean
Since it began back in January 2021, the ISBS women’s circles have been an opportunity for women in sports biomechanics at various stages in their career to converse, network, and share their experiences. Each circle is made up of 5-6 women who self-organize to meet on a regular basis, juggling time zones and work schedules to bring everyone together.

Six months later, the Circle Back event was created to bring the community back together! On the 28th of June, all the current circles (with 6 active circles at the time) were invited to share their ideas and experiences. Hosted by Elaine Tor, with over 40 women in attendance, the groups worked towards sharing their thoughts on key discussion points and how to get the most out of their circles including:

- Top 3 themes of discussion during circle meetings
- The best thing about your circle
- Suggestions of how to use the circles in the future

The discussion highlighted many excellent features of the ISBS women’s circles, emphasising the great opportunity to connect with like-minded people across the biomechanics world and share ideas from a rich background of students, academics and working professionals. Each circle tries to come together every 4–6 weeks to discuss various topics including networking opportunities, mentoring and career pathways. Sometimes they are simply used to catch up, provide support, and see how everyone is doing (over a breakfast cappuccino or a late night snack). Perhaps most importantly the circles create and provide a safe and supportive space to discuss some of the challenges that women in biomechanics face but also provide the opportunity to act as champions and build each other up.

Following on from the group presentations in the Circle Back meeting, smaller breakout rooms provided the atmosphere to network and further discuss how the ISBS circles could be used in the future. Pooling together resources, which is a major strength of the International Women in Biomechanics (IWB) group, bringing together people in similar geographic and career stages, and utilising a ‘circle swap’ were some of the ideas to grow this network of women and allies in biomechanics in the future. If this article sparks any ideas or suggestions as you are reading, please reach out and let us know!

Overall, it was a great meeting and even provided the chance for a quick Slack tutorial from Ina Janssen at the end! There are now 12 active circles and growing. If you are interested in taking part in this great initiative and would like to join a circle, send your details and career stage to vpresearch-projects@isbs.org. Want to stay in touch and share ideas? All members are welcome to join the Women in Sport Biomechanics channel within the ISBS Slack group.

For further information on the ISBS Women’s circles visit our website.
Mothers’ Café

During the ISBS Annual Conference, Dr Isabel Torres, co-founder & CEO of Mothers in Science, joined The Mothers Cafe as a guest speaker. Mothers in Science held their first conference in May 2021 entitled ‘Motherhood and Career Retention in STEMM’. This conference brought together STEMM students and professionals, non-profit organizations, research institutions and science societies to discuss the structural barriers holding mothers back and to brainstorm long-term actionable solutions to close the gender gap in STEMM. Dr Torres shared findings and resources from the conference. This presentation was recorded and is available for all to view as part of the ISBS Annual Conference recordings.

![Mothers in Science Logo]

After the guest speaker, it was time for further discussion and an informal chat with fellow ISBS members. Johanna Rosén (PhD Candidate from the The Swedish Sports Confederation) participated in the Mothers’Café for the first time and shared these experiences:

‘For me as a new mom, the mothers café is a valuable community in which other women in the same situation as myself give great support and where highlights and struggles both as a mom and a researcher can be shared and discussed.’

Save the date!

We are pleased to announce that the next ISBS Mother’s Café will take place on 3rd February 2022 during the Mid Year Symposium (8 am GMT). In this session, we will hear experiences from fellow ISBS members and associate editors who are mothers about: How can you keep your career progressing when you become a mother? All welcome!
I have always had a strong affinity with the ISBS mission, “to bridge the gap between researchers and practitioners” and for me, I try to bridge the gap through my endeavours in coaching athletics. On a personal level, coaching is the way that I strive to apply the knowledge and insights I have gained through research. I do not see coaching and biomechanics research as different roles but for me, they are two sides of the same coin; I am still a biomechanist when I coach and still a coach when I research or teach biomechanics. Coaching also allows me to interact with practitioners (including athletes, coaches, therapists, strength and conditioning experts etc.) in the training or competition environment and it is through these interactions that further bridging of the gap can occur.

This year I had the honour to be the Team Ireland coach for the mixed 4 x 400 m relay event and it was truly a special privilege to work with a team of athletes through the qualification competition at the World relays in Poland and at the Olympic Games in Tokyo. The mixed 4 x 400 m relay was a new event at the Olympics and it is a unique and special event, which allows men and women to compete together on an equal basis as a team. It has all the technical aspects of 400 m running and relay performance with some added complexity as it involves baton exchanges between men and women where the management of speed differences can affect the exchanges.

While Tokyo 2020 was an Olympics like no other because of COVID-19 restrictions, the general preparation at the holding camp and in the warm up area immediately before competition was similar to any other major championships. The Team Ireland holding camp was in the city Fukuroi (some 3 hours by bus from the Olympic Village in Tokyo) and we were lucky to have a hotel and its extensive grounds to ourselves. The warm welcome from the local people was also something all Team Ireland athletes and support staff really appreciated. In Fukuroi, I had excellent opportunities to meet with athletes, coaches, physiologists, nutritionists, psychologists and all the extended support staff in Team Ireland and sharing of ideas on sports biomechanics was a regular topic of discussion. In many aspects, the holding camp environment was similar to an ISBS conference as it brought together people with common interests and a passion for sport.

The competition itself was strange because of the lack of spectators, but it still retained a special atmosphere because of the quality of the athletic performances. That atmosphere was apparent on the pre-competition visit to the Olympic Stadium, where you could just sense the tension and excitement. Despite all the problems and global restrictions leading up to Tokyo 2020, the levels of performance in athletics were quite astonishing. In the men’s 400 m hurdles final, 3 men ran under 47 seconds and in the mixed relay our team ran under 3 min 13 seconds to qualify for the final (a time that would easily have won the World Relays Championships just 3 months before the Olympics). There were many other remarkable performances on the track and this stimulated many questions: Was it the mechanics of new track surface? Was it the new footwear that athletes used? These are definitely interesting questions for sports biomechanists! My own view is that the new track surface and the developments in footwear may have had a very small effect but it may not be easy to measure this effect. For me the more likely explanation is that because of COVID-19 many elite athletes had more time to train effectively and spent less time competing. For some athletes, this was challenging but for others especially at the highest level, this extra training and preparation time with fewer competitions really did matter. Either way, I look forward to reading the results of the studies that will follow on this topic and I look forward to many more discussions with practitioners at future championships.
Overall Tokyo 2020 lived up to the hype. It was my first time working as a sport scientist at an Olympic Games, and I was lucky enough to be there in two separate roles. My first role was with the Canadian Olympic Committee, where I was a Performance Technology and Analysis Specialist. There I worked with any Canadian sport/coach/athlete that required technology or data analysis services. In this role I mainly worked with judo, athletics, and artistic gymnastics. My second role was with Canoe Kayak Canada, where I was a Performance Analyst with the canoe sprint team.

I remember walking through the village one day and thinking “This is literally a scientist’s dream. To be in a 2 km by 1 km area with the world’s best athletes. Can you imagine the studies and knowledge we could learn here?!?”. The interesting part about being at the Games is that much of the research and planning has already been completed. Therefore, even though I am a researcher with some of the teams, I mainly played a support role while I was at the Games. I collected video for the Canadian women’s artistic gymnastics team for feedback after podium training. Getting to see the likes of Ellie Black and Simone Biles completing their routines in person was eye-opening. I definitely saw the limits of human performance that day.

Where my work at the Games really bridged a gap between research and practice was at the Sea Forest Waterway, where canoe sprint competed. A lot of my PhD research has focused on pacing in the sport. By digging deep in data that had been collected at previous events I was able to use principal component analysis to reduce those data down into useable pieces for the coaches and athletes. This work was published last year in the journal *Sports Biomechanics*.

From a practical perspective, if you looked closely, every boat on the water had a Tokyo 2020 GPS/IMU on it. The data those devices provided were given to each team at the end of the competition day. In addition, some boats had another device on the boat collecting the same data. Canadian boats had these devices to give us valuable information (like velocity, stroke rate, stroke distance, etc.) immediately after each race. With semi-final and final races happening only 1.5 hours after one another, we had no time to waste. As a race finished up, I ran from my air-conditioned office to the hot and humid dock to grab the GPS device. I’d then download those data, sync it with video (supplied by the hosts) and then analyze it. Within 5-10 minutes the athlete(s), coach, and myself were discussing the previous race’s tactics and had plan of attack for the next race. Luckily this work paid off for some of the athletes, with a couple medals and some career best performances coming out of the Games.

I’m sure this is just one example of many where sport biomechanics played a role at the Games. One thing I learned, and as I said above, is a lot of the biomechanical data collection and analyses occur in the lead up to the Games. That’s where I got to travel with the team, discuss science, collaborate with the coaches, and try new things I had learned from research. This is where I think sport biomechanics has the most impact. The Games are just where we get to see (and learn) if those changes and experiments worked or not!
In August and September this year I was fortunate enough to travel to the Tokyo Paralympics as part of the support staff on the Australian Swim Team. There were two main phases of the campaign, a two week preparation camp in Cairns (Australia), then three weeks in Tokyo for the Paralympics competition itself.

My role on the team changed through the different phases of the campaign. During the training camp in Cairns I worked with the coaches on pool deck around technical refinement of different areas of the swimmers performance. In practice within a training environment this is much more of a coaching role, using video and verbal feedback, drills, and technical cues to get the swimmers to adapt their movement patterns. However, the focus areas we worked on in the camp were based on a large amount of previous work using competition race analysis and a variety of analysis methodologies (e.g. in-pool force plates, linear position transducers, kinematic video analysis) to identify the performance priorities for each swimmer in terms of technical development.

Once we got into the competition environment in Tokyo the nature of my role altered to be more focussed on competition race analysis. Each race was broken down to look at performance (time) through different phases (e.g. start, free swimming speed, turns), and how this was achieved; for example stroke rate, stroke length, and number of kicks underwater off a start or turn. This information was then fed back to the coaches and athletes, compared to their previous performances or race plans, and used to advise strategy and focus points for subsequent swims (e.g. heats to finals).

All of this forms part of an iterative process of on-going development for the athletes. Race analysis will be used again post-competition to identify future areas of development in planning for the next major competition. This is then combined with biomechanical analysis and findings from applied research that improve our understanding of performance to put in place training and technical development plans to help the swimmers in their quest to continually get faster!
This spring was our first general election in which students were allowed the right to vote for society directors. This “first” comes from the work of Johannes Funken the ISBS Student Representative from 2018-2020!

ISBS also welcomed our first Student Director, Evan Crotty, at the close of the ISBS 2021 Conference. This marks the first time the society will have two students on the board of directors. Evan joins the team of directors motivated and with fresh and practical ideas to support ISBS students. Together we encourage students to:

1. **Get to know your student directors**: we are here for you!
2. **Share your opinions** and needs to us for future events
3. Use your voice & **vote for directors** in future elections & motions
4. **Get and stay involved** in this great community

Despite time zone challenges, ISBS students gathered online for the “Student Pub Night” at the ISBS 2021 Conference. Thanks to all students that joined us for this fun social event (most featured here!). We enjoyed the time to share some experiences and laugh at our online presentation mistakes (think: displaying the presenter view, internet lags, etc.). Then students split into teams for a fun trivia competition. Here’s some of the fun facts we didn’t know about Australia:

- There are over 2700 clocks in the Australian Parliament House
- About 35% of Australia is considered desert
- The Australian Institute of Sport opened in 1981
- 21 of the world’s 25 deadliest snakes are found in Australia
- Australia has over 10,000 beaches (let’s go!!)

We are already looking forward to sharing time with students in February at the ISBS Mid-Year Symposium and at the 2022 conference!
While it may be another year without in-person conferences, the ISBS community has continued to stay connected through the mid-year symposium and the online conference. It was great to catch up with members and engage in some great talks and workshops across both events, and I am excited for reconnecting in person for ISBS 2022 in Liverpool. A huge thanks goes to the whole Canberra team for the organisation of this year’s online conference, and in particular to Cody Lindsay, for the organisation of the student side of the conference.

ISBS conferences and the ISBS community has been largely involved in my student journey. This begun at my first ever academic conference in Auckland in 2018. While there, I connected with experts in the field, one of which has become a key collaborator on my PhD research program. My first conference experience not only was pivotal for my research program, but it also opened my eyes to the student and academic community that is a central part of the ISBS conference. As one of your ISBS Student Directors, my goal is to provide opportunity for our student members to develop their research skills, stay connected with the ISBS community, and encourage participation in the incredible networking opportunities ISBS offers (Student-Mentor event, Slack channel, ISBS Women’s Circles).

I would like to acknowledge the extraordinary work done to date by current student director Stephanie Moore, and I look forward to working with Stephanie on some exciting student additions to the ISBS website. As always, students are welcome to get in touch with any questions or specific ideas they have that could enhance the ISBS student experience.

Looking forward to seeing everyone virtually for the ISBS Mid-Year symposium and in person for the ISBS 2022 conference.

Sincerely,
Evan Crotty

ISBS Student Director (2021-2023)

**ISBS Key dates 2022**
ISBS Mid-Year Symposium: 2nd-3rd February 2022
ISBS conference: 19-23rd July 2022

*Keep in touch on social media channels:*

[Slack](@evancrotty_)
[Twitter](@steph_r_moore)
The ISBS Student Mentor Program was held for the 10th time, and was once again virtual this year. 37 students from 12 different countries were matched with 37 mentors from around the world. Mentees were matched with mentors based on interest and experience and met online at a time suitable to both. There was the opportunity to discuss research and career paths. There was a 1-1 ratio between mentors and mentees which enabled students to receive lots of individualized advice. As the virtual format seemed to be successful in connecting students and mentors, a virtual Student Mentor Program to support students unable to make the annual conference is being considered for future conferences.

ISBS mentoring meeting this morning (Brazil time) with @mrobbol8 from Liverpool John Moores University! It was a great chat, one hour flew by! Thank you Mark and @ISBSOFFICIAL!

Hard to put the value of the @ISBSOFFICIAL Student Mentor Program into words! Thx to @janssen_ina for connecting me with Marcus Lee. A perfect match! Stimulating conversation about interdisciplinary collaboration, leadership, org development, and some biomechanics stuff, too 😊

Had a wonderful #ISBS mentorship chat with my mentor Dr Laura-Anne Furlong ( @LAMFurlong )

Talked about Biomechanical imaging, musculoskeletal profiling, muscle mechanics and research design.

Here’s to more such discussions in the future!
Nayun Ahn (Marquette University) participated in the Student Mentor Programme for the first time and shared these experiences:

This ISBS 2021 at University of Canberra in Australia was my second time to attend the conference, but this was my first time to attend the Student Mentor Program. I was hesitant and nervous to attend this program at first. As an international student who is non-native English speaker, I was careful not to make any mistakes, and worried not conveying or expressing my thoughts very well. However, I think it is essential to share thoughts and ideas with other researchers and students if I plan to build my career in academia, so joining this mentoring program can be one of the learning experiences that I can be exposed to and take advantages as a student. As a third year Ph.D. student, research interests become more specific, and I cannot but think about the future career. At this point, listening to senior mentor’s research path, experience, and asking advice would be a great opportunity for me to think broadly and consider a better option later, thus I decided to join this program.

I met my mentor via a virtual meeting, and my mentor was very willing to provide support and help before and during the conference. My mentor shared his academic career, and it was interesting to discuss how my mentor experienced diverse research interests, teaching students, had challenges and success on the way until now. I shared my current research interests and path, and my mentor very carefully listened to my thoughts and provide sincere advice. Additionally, my mentor gave me positive feedback after my presentation during the conference, which made me feel supportive and encouraged.

After I’ve been through the ISBS 2021 conference, I think attending the Student Mentor Program was a good decision and rewarding opportunity that I had. It would have been better to meet my mentor in person, but I am pleased with this valuable experience and had a good match with my mentor. In conclusion, I would like to recommend this Student Mentor Program to all students who are planning to attend future conference.

Thank you to all of the mentors who volunteered their time and experience. Details regarding the Student Mentor Programme at ISBS 2022 in Liverpool will be available in the March/April 2022 newsletter and on the conference website. I hope to see many of you there!

Ina Janssen
ISBS Vice President (Research and Projects)
Dear Members,

The ISBS annual membership fees and sponsorships from our partners allow us to continue supporting our members through different initiatives such as the internship grant and student research grant to name a few. The ISBS annual membership fee is collected each calendar year. You can renew yours at [www.isbs.org/membership](http://www.isbs.org/membership) and subscribe for 1 or 3 years. Please check and update your affiliation and postal address as all correspondences from ISBS will be directed there. All current members have access to the journal *Sports Biomechanics*. Please note that access to the journal may not be available if there are restrictions imposed by a member’s home country. We seek your understanding that ISBS has no jurisdiction over these restrictions. We look forward to growing ISBS with you so that we can continue supporting biomechanists around the world to help others to live better through the application of biomechanics.

All the best!
Marcus Lee

Treasurer

**Society Administration**

The Society’s Pre and Post Conference Board Meetings and Annual General meeting were held virtually this year. Minutes and reports for these meetings are available in the **Society Administration** tab of the ISBS website for members.

**History of ISBS**

The [ISBS newsletter archive](https://www.isbs.org/newsletter) has been updated, with the addition of 23 issues from between 1985 and 2000. This also enables the updating of our record of [past officers](https://www.isbs.org/). Thank you to Julie Steele for sharing the original documents. Please contact Stuart McErlain-Naylor if you have any suggested updates. For those with an interest in the history of your society, you may be interested in this [2008 conference paper](https://www.isbs.org/conference-2008) detailing the founding and development of ISBS from the perspective of one of the founding members.

**Video Lectures and Presentations**

The members area of the website now includes a video repository ([link—must be signed in](http://www.isbs.org/membership)). This contains all presentation videos from the 2020 and 2021 annual conferences, the 2021 Mid-Year Symposium, and the *Sports Biomechanics Lecture Series*. We hope that this will become a very useful resource for members, and will be added to with this year’s Mid-Year Symposium and any other future events.
Update from VP Public Relations

Floren Colloud

Society Sponsors

ISBS is proudly supported by two corporate sponsors (Vicon and Qualisys) and would like to warmly thank both of them. They provide important support to the mission of ISBS thorough their quality products and financial support to the Society. We encourage you to consider these fine vendors of sports biomechanics research equipment and software when purchasing or updating your lab equipment.

Affiliated Societies

ISBS is currently affiliated with five societies: the European Society of Biomechanics (ESB), Société de Biomécanique (SB), International Society of Biomechanics (ISB), Arab Society of Biomechanics in Sports (ArabSBS, formerly Arab Society of Biomechanics and Motor Behaviour) and since this year the Japanese Society of Biomechanics (JSB; see page 30). This is an exciting opportunity for all and we look forward to working closely with these learned societies to grow the discipline of sports biomechanics. As part of our affiliations with ESB, SB, ArabSBS and JSB, members of ISBS can attend their conferences with the same registration fees as their own members. Check out their websites for further information on their annual conferences and deadlines for submitting your abstracts.

Mid-Year Symposium Sponsor 2022

A second mid-year symposium will be will organised online, 2nd - 3rd February 2022 (information on page 5). We do not have dedicated sponsors yet but are confident to have sponsors joining us for this event. Do not hesitate to contact me if you are aware of a company that would wish to be a sponsor.

National Biomechanics Day 2022

In 2022, the National Biomechanics Day (NBD) will be organised on April 06. This international event aims to expand the influence and impact of biomechanics on our society by expanding awareness of biomechanics among the general public. Many events are targeted at young people, in particular teenagers, but a key aim of NBD is to engage the general public with our discipline and showcase what an exciting, relevant, scientific discipline we work in.

ISBS is a proud sponsor of NBD and encourages all his members to run in-person or virtual event. If you are hosting an event, please register online, and if possible send through details and images of your event to me via email for inclusion in our October ISBS newsletter. See page 32 for more detail.

Sports Biomechanics Twitter account

Sports Biomechanics, the official journal of ISBS, has a very active Twitter account updated by our VP Publications, Dr Stuart MacErlain-Naylor from the University of Suffolk, UK. All new research articles are posted as they are published. I encourage you all to follow this account if you have not already, like, retweet and comment on the research being posted. The dissemination of our activities to the wider community is a key part of our society ethos to bridge the gap between research and practice, so please take a few minutes to browse and share to help achieve this goal and grow our discipline further.
Every year, approximately 100-150 ISBS members do not renew their society membership. In order to identify the reasons for members not renewing, an anonymous survey was sent at the start of 2021 to almost 450 former ISBS members (expired in 2017-2019) to identify the reasons for this in order to find ways to retain membership. Below we have summarised the findings with suggestions on how ISBS can improve this for its current membership. For more detailed results, please check the ISBS website (ISBS Pre Conference Meeting Materials).

Total Responses: 71 former members; 77.5% male identifying (N=55); 22.5% female identifying (N=16)

Level of membership: 71.8% Professional Member (N=51); 22.8% Student Member (N=20)

How long were you a member?

What were your reasons for becoming an ISBS member? (check all that apply)

- To attend the annual ISBS conference
- To be a part of the ISBS community
- To learn about and promote sports biomechanics
- For access to the journal (Sports Biomechanics)
- It was recommended by a colleague/mentor
- To attend an applied session at an ISBS conference
- To attend an e/virtual ISBS conference
- To be eligible and apply for grants
- To be eligible for awards
- Won membership on 2min tweet competition
- Service to the organization on Board of Directors
Former Members Survey Results (Cont.)

Why did you not renew your ISBS membership? (check all that apply)

- I only renewed my membership when I could go to the conference
- Forgot to renew
- Financial reasons
- I have joined other societies more aligned with my interests
- I was not happy with the member support from the society, I wanted more services from the society
- Due to family caring commitments I was unable to maintain contact with the society

What could have persuaded you to stay a member? (open responses)

- Greater discounts for countries in development.
- More grants/ awards for developing countries students/ members/ professional
- Low fee or free membership if not attending conferences/taking advantage of perks (journal)
- Reminder email for renewal
- Reduction in annual membership fee
- More benefits
- Constant programs and activities
- Society could provide more platforms for professional trainings, research collaboration, etc
- More activities from the organization which requires membership access
- Maybe more involvement in community affairs, joint research

ISBS initiatives to retain members

⇒ ISBS is investigating options for a simpler way to renew membership including notifying each member whose membership is expiring.

⇒ The ISBS Caregivers Membership commenced in 2021 and provides support for those members with family caring commitments.

⇒ ISBS is investigating the possibilities for providing members from Economically Developing Countries financial support to maintain their membership.

⇒ In 2021 ISBS offered new events and initiatives which were for members only including the Mid-Year Symposium, Society Slack Channel and women’s circles and events. ISBS will strive to continue providing events and initiatives for members only that are independent of the ISBS Annual Conference so that members see the benefit in keeping their membership current event if they are unable to attend the Annual Conference.

Do you have any other suggestions on how we can retain your membership? Let us know!
Our society started in 1957 under the name of "Kinesiology Study Group" by 24 people who are interested in biomechanics gathered at the Japan Society of Physical Education, Health and Sport Sciences. Then, in 1972, the society held the first domestic conference in Nagoya. It was renamed to the Japanese Society of Biomechanics in 1978. Currently, there are about 1200 members. We have held academic conferences biennially, edited and published "Japanese Journal of Biomechanics in Sports and Exercises", and held various educational seminars and workshops.

As an international conference, the 34th annual conference of ISBS was held in Tsukuba in 2016. The 8th biennial congress of the International Society of Biomechanics (ISB) was held in Nagoya in 1981, and the 16th ISB was held in Tokyo in 1997.

Many Japanese researchers have participated and made presentations at ISBS conferences so far. With this agreement between JSB and ISBS, it is expected that the number of Japanese researchers participating in the ISBS conference will increase more in the future.

In the time of this Covid-19 pandemic, we first recognized the convenience of online academic exchange. However, at the same time, we realized again the importance of face-to-face interaction. After the end of this pandemic, international exchange in research activities will become active again. We believe that the affiliation provides an opportunity for ISBS and ISB members to interact in biomechanics community.

From 2021 this year, we have changed our conference from biennial to annual. It is planned to be held at the University of Tsukuba in 2022, and in Fukuoka in 2023. The Fukuoka conference (Co-Chairs: Drs. Hiro Nunome and Hiro Hobara, July 30-August 3, 2023) will be held jointly with the biennial ISB congress.

We hope that many friends in the field of Biomechanics in Sports from all over the world will participate in and make presentations at our JSB conference.
ISBS members win Xsens University Biomechanics Challenge

ISBS members Dr Celeste Wilkins, Isabeau Deckers (PhD Candidate) and Amelia Dingley (Sports Scientist) won the inaugural Xsens University Biomechanics Challenge. The team from Hartpury University in the UK delivered a novel solution to the case study challenge: deriving an estimate of power during the bench press, squat, kick and throw from IMU data, and presenting these in a visual way for an athlete or coach.

The Xsens Biomechanics Challenge took place over the course of three weeks and involved over 208 participants. Each team tackled the same case study, with kinematic data from an Xsens motion capture suit provided for the exercises. In the initial round, the competitors submitted a two-page referenced abstract and athlete/coach report with their solution. Nine finalists were then chosen to present their solution in a seven-minute presentation to a panel of judges from academia, physiotherapy and industry. The challenge was truly global; the finalists represented universities in North America, Europe and Asia.

The winning team, dubbed Team Horsepower, took on the challenge from a very applied perspective given their strong background in applied sport. Isabeau is a Chartered Physiotherapist (human and veterinary), Celeste’s research interest is in equestrian rider biomechanics and Amelia was a strong competitor in gymnastics before pursuing sports science. They leveraged Celeste’s expertise in data processing with MATLAB and Visual3D, while Isabeau and Amelia lent their expertise in liaising with coaches and athletes to produce a report with visuals that could be easily interpreted by an athlete or their team.

Celeste said: “Our goal in research and applied practice has always been to help athletes understand how they can achieve their best performance. This technology will be a big asset to our Human and Equestrian Performance centres, allowing us to expand our analysis capabilities outside of our labs onto the pitch or equestrian arena.”

Isabeau said: “It has been such a great experience to participate in the Xsens Biomechanics Challenge, and even more to have been selected as the winning team. I am so excited about our future research projects with the kit that we’ve won.” Amelia added: “We’ll be able to integrate this technology into our teaching and practical sessions, enabling students to visualise human movement and bring theory concepts to life.”
Hello to all our ISBS Friends and Colleagues,

As the world awakens, we all emerge a bit differently than we were one and a half years ago. National Biomechanics Day has also changed and now presents itself as both a Biomechanics STEM- and STEAM-based outreach program and also a funding source supporting outreach and growth for Biomechanics. After six successful years, NBD has become part of the Biomechanics firmament through the efforts of so many of you and of our colleagues around the world. NBD Thanks everyone for your energetic support.

Our outreach work, i.e., your outreach work, changed from in-person events to various forms of virtual and online experiences this year. The only roadmap we had for this departure from our previous efforts was your creativity and desire to continue working with young people and to introduce Biomechanics to these future scientists and practitioners. And we say loudly that your creativity was incredible!! This creativity is on full display on our website listing dozens of groups who created new, online learning centers for Biomechanics. Please scroll down the page and click some of the labs, their videos, and their online lectures and demonstrations. We admire so much the effort all groups made to producing fun, informative, and educational virtual experiences for the next generation of Biomechanists.

NBD, through its parent organization, The Biomechanics Initiative, expanded its mission this year with grant programs designed to aid Biomechanists in producing NBD events. We partnered with ASB in the Black Biomechanists Outreach Through NBD program, with ISB in the NBD Outreach For Women in Biomechanics, with the Brazilian Society of Biomechanics in the Brazilian Biomechanics Experience, and with The Australian & New Zealand Biomechanics Society and Books of Discovery in the Australian Transportation grant program. Through these programs and with the contributions from these groups, we distributed over $10,000 for creating new NBD events around the world. “Around the world,” included Nigeria, Australia, Brazil, New Zealand, and the U.S. It is through our loyal sponsors including ISBS that we are now able to give back to the Biomechanics community, i.e. you! We concentrated on underserved people this year and we will continue to work with various groups in the coming years. Look for NBD grant announcements this month. We also hosted our first NBD Sponsors’ Technology Forum in 2021. Seven of our tech sponsors participated by demonstrating their products and ideas to many biomechanists through 8-minute informative presentations. We plan to hold a second Sponsors’ Technology Forum in the near future.

Please look for announcements about NBD 2022 in the coming weeks and please join us in our truly communal, worldwide effort in growing Biomechanics. NBD, where science meets fun!

Sincerely,

Paul DeVita, Lisa MacFadden, Felipe Carpes, and Adam Hawkey, NBD Board of Directors
Through the 100-day Biomechanics Research and Innovation Challenge (BRInC), 100 Australian high school girls from diverse backgrounds will work with 25 early career female biomechanists to develop their own biomechanics story.

A 100-day Biomechanics Research and Innovation Challenge (BRInC), funded by the Federal Government’s AusIndustry Women in STEM and Entrepreneurship grant program, aims to raise awareness and participation of high school girls in biomedical engineering, through focusing on the exciting field of biomechanics. Additionally, it aims at growing the leadership capacity of current early career female biomechanics by giving them access to professional training and support to develop their expertise as STEM mentors and future leaders in biomechanics.

Over a period of 100 days, during terms 1 and 2 in 2022, the girls will conduct a biomechanics project with the support and guidance of the mentors and attend a series of immersive workshops and masterclasses to build key STEM and life skills. The hands-on program will expose girls to the creative, applied field of biomechanics and increase their awareness of associated entrepreneurial opportunities.

The project is led by Dr Celeste Coltman from the University of Canberra together with seven other early career female researchers and biomechanists across Australia: Dr Taylor Dick (University of Queensland), Dr Michelle Hall (University of Melbourne), Dr Crystal Kean (ISBS Member; Central Queensland University), Dr Karen Mickle (La Trobe University), Dr Laura Diamond (Griffith University), Dr Martina Barzan (Griffith University) and Dr Jayishni Maharaj (Griffith University). The project is in collaboration with BrainSTEM, an industry partner with extensive experience in STEM based mentoring programs.

We are looking for female early or mid-career researchers in the field of biomechanics or biomedical engineering to join the BRInC program as mentors. If you have been looking for a way to inspire young girls to study biomechanics, join us now. The BRInC program will give you access to a supportive network of female biomechanists that will help you to take your career to a next level.

Email us for further information and signing up at brinc@canberra.edu.au. Follow our journey on social media at Twitter, Facebook, LinkedIn and Instagram and help us raise awareness of the exciting field of biomechanics.
ISBS Officers & Directors

ISBS Officers

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2020-2022

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Stephanie Moore
University of Salzburg, Austria
(Student Representative)

2021-2023

Steffi Colyer
University of Bath, UK

Evan Crotty
University of Limerick, Ireland
(Student Director)

Johannes Funken
German Sport University, Germany

Drew Harrison
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Hiro Hohara
National Institute of Advanced Industrial Science and Technology, Japan

Gretchen Oliver
Auburn University, USA

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Elaine Tor
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