



International Society of Biomechanics Newsletter

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AFFILIATE SOCIETIES OF ISB:

American Society of Biomechanics, Australian and New Zealand Society of Biomechanics, British Association of Sport and Exercise Sciences, Bulgarian Society of Biomechanics, Canadian Society of Biomechanics/Société canadienne de biomécanique, Chinese Society of Sports Biomechanics, Comisia de Biomecanica Inginerie si Informatica (Romania), Czech Society of Biomechanics, Taiwanese Society of Biomechanics, Japanese Society of Biomechanics, Korean Society of Sport Biomechanics, Polish Society of Biomechanics, Russian Society of Biomechanics, Société de biomécanique (France)

Note from the President

The year 2004 brings with it many things. For me, one of these is disbelief. I can't believe that 20 years have passed since a group of us began our careers in biomechanics after graduating from Penn State University.

Reunions bring about lots of memories. Although those of us in that small group do see each other from time to time, it's fun to come back together where it all began—in a biomechanics laboratory that was located—literally—in a water tower.

When I think back to these school years, I remember being the only female in the program (boy, how times have changed!), and how mentors really helped me get my start in the field.

All of us in the International Society of Biomechanics have our biomechanical roots in different settings. We're spread throughout the globe and have many obligations. But one aspect of our field that we need to focus on—despite our time constraints—is mentorship.

I'll bet that all of us have benefited from at least one mentor over the years. I remember having many mentors; some of them would do something as simple as give me a "nudge" in the right direction. Others were endlessly encouraging, which helped me to become confident in myself and my abilities, they would give me help when I needed it—and sometimes even when I didn't know I needed it.

Looking back at the 20 years that have passed since I began my biomechanics career, I see so clearly how many accomplishments I may not have made if not for their assistance.

Now, it's time for all of us to give back. Mentoring young scientists is critical. ISB provides many opportunities for mentorship including the ISB Student Grants, particularly with the International Travel Grants that enable students to spend months learning at scientists' labs in other countries. Read the first of a large number of students reporting their exciting and rewarding experiences abroad in this Newsletter.

But the ISB does so much more. We now have a student representative as a member of the ISB Council (His first report is included in this newsletter). Through the students' reports regularly printed in the newsletter, we can see firsthand how important mentorship is for their scientific development.

In addition, the New Zealand affiliated society is helping students by providing a way for them to get to ISB conferences with help from the

Jim Hay Award. As a tribute to the late Jim Hay, a New Zealander well-known for his mentoring as well as his work in sport biomechanics, the society is giving the Jim Hay Award. (See the announcement of this Award inside this newsletter.)

As I've gotten older, I've often found myself in a variety of mentorship roles. Now, I really appreciate being in the position to help foster the development of others, as they will be the future scientists and biomechanists.

If you're not sure where to start in becoming a mentor, here are some tips. On an individual level, you can encourage students to apply for the ISB Student Grants. Help students network in the field; introduce them to your colleagues. Provide graduate students with practice in journal manuscript review and grant review (this can be done formally or informally). Encourage students to participate in the ISB Student Initiatives (see the report from Motoshi Kaya). Perhaps you can even invite student participation in your laboratory as a host institution for a student travel award applicant. Remember, sometimes being a mentor simply means being an effective listener and adviser—something all of us can do.

Before I close my note for this issue, I want to point out a few important stories inside. Included is a report on changes in the constitution voted in by you, the ISB members. These constitutional changes are available on the ISB homepage which shows the full new constitution for ISB. Ewald Hennig brings us up-to-date on the technical groups, and Mario LaFortune announces a new award sponsored by Nike.

This summer, the ISB council will be holding its mid-conference meeting just prior to the European Society of Biomechanics meeting. The proposed agenda is included.

Finally, in this issue, we focus on one of our ISB affiliated societies: Japan. This article from Senshi Fukushima describes the Japanese Society of Biomechanics. It provides a great opportunity to get to know how biomechanics is promoted in different parts of the world. By gaining insight like this into different societies and their activities, we can get to know each other better and facilitate international networking.

Until next time...

Mary Rodgers

ISB council: Student Representative

Dear fellow student members of the ISB!

My name is Motoshi Kaya, and I am a PhD student at the University of Calgary with Dr. Walter Herzog. At the past meeting of the ISB, I was appointed as the first ISB Student Representative in order to transition to an elected position. As such, there is currently no framework as to the duties of the student representative, nor is there a procedure in place for selecting the next student representative. I see my role over the next 2 years as follows:

First, I would like to establish and facilitate communication between student members of the ISB and the executive board; Second, I would like to convey requests from the student members to the conference organizers. Such requests may include suggestions for tutorial sessions or organized lunch with keynote and/or invited speakers; Third I would like to organize social events at the upcoming ISB meeting in Cleveland 2005, such as a student breakfast or luncheon, or anything that might come forward from you); and finally, I will organize the election procedures for the ISB Student Representative for the 2005-2007 term.

Regarding the first three points, I would hope to have input from student members. Regarding the last point, the student representative elections, I propose the following:

- (i) We will elect the next Student Representative during the ISB congress in Cleveland, USA (Aug 1-5, 2005).
- (ii) Possible candidates will need to inform me prior to the conference or at the election meeting that they would like to run for office. Each candidate is then given three minutes to introduce her/himself, and tell the students why s/he wants to be the student representative and what they would like to accomplish during their term.

- (iii) In order to be eligible for student representative you need to be a full-time student who has finished at least one full year of PhD studies. (Note people late in their PhD program who will finish graduate studies prior to the next congress are eligible).
- (iv) The student representative is then elected by open vote (show of hands) from the ISB student members. The candidates will not be present for the voting, and will be informed immediately after the vote of the outcome. At that time, the current student representative will step down and give the position to the new candidate, who then may conduct a meeting to establish goals for the upcoming two year period.
- (v) Note, a student representative will hold the position from one ISB conference to the next (i.e. a two year term). A student can hold the position only once. The person with the second most votes in the election will become the student representative should the elected person step down prior to the next congress (i.e. during the two year term).

I would like to emphasize that the above procedures, as well as the duties I gave myself as the student representative are open for discussion, and in that sense, I would be happy to hear from you about any concerns or suggestions you may have.

I hope to see you all at the Cleveland ISB conference.

Motoshi Kaya
motoshi@kin.ucalgary.ca

History and current state of the ISB technical groups

Four technical sections are currently organized in the ISB: The Computer Simulation Group, the Footwear Biomechanics Group, the 3D Analysis of Human Motion Group, and the International Shoulder Group. These groups provide a forum for scientific communication on specific issues. This is achieved through the organization of international symposia, publication of symposia abstracts or proceedings, and web based discussion forums. All technical groups have internet home pages and the Computer Simulation as well as the Footwear Sections each have their own Discussion Forum News Group.

Each of the groups has had a history of symposia for many years, before becoming officially affiliated to the ISB as a technical group. There are no exact numbers of active members in each of the groups because no official membership is required. As judged from symposium attendance, the typical number of active individuals in the groups are between 50 and 200. There are no constitutions for the ISB technical groups to date. However, as a result from last years footwear group meeting in Queenstown, Keith Williams has prepared a draft for a constitution for this group. It was passed on to the board members and, after voting, will be in effect in the near future. In the following sections there will be information on the history, executive board members, internet address, and planned conferences for each of the groups. The descriptions will be chronologically sequenced with the TGCS being the first technical group, affiliated to the ISB in 1991, to the most recent addition of the Shoulder Group in 1999.

Technical Group Computer Simulation (TGCS)

This group provides exchange of information related to computer simulation approaches in biomechanics (methods, software, hardware and applications) and aims to formulate standardized terminology of computer simulation in biomechanics. The Group was founded by Mont Hubbard and the late Dr. Andrzej Komor (Institute of Sport, Warsaw, Poland) in 1986 and held its first meeting at the Institute for Aircraft Engineering and Applied Mechanics, Warsaw University of Technology, Warsaw, Poland in June, 1987. Following symposia were held at the University of California, Davis, USA in 1989 and the University of Western Australia, Perth, Australia in 1991. At the XIIIth ISB congress (Perth, 1991) a general meeting of the Working Group on Computer Simulation voted to become a Technical Group under the revised ISB constitution. Following symposia were held in Paris / France (1993), Tokio / Japan (1997), Calgary / Canada (1999), Milano / Italy (2001) and Sydney / Australia (2003). For the conferences in Calgary, Milano, and Sydney online symposium abstracts are available via the TGCS homepage.

Executive Board:

CHAIRPERSON:

Federico Casolo, Politecnico di Milano, Milan, Italy

SECRETARY GENERAL: Rick Neptune, University of Texas at Austin, USA

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Victor Ng-Thow-Hing, Honda R&D Americas, Mountain View, CA, USA

Marcus Pandy, University of Texas at Austin, USA

Frans C.T. van der Helm, Delft University of Technology, The Netherlands

Arthur J. van Soest, Vrije Universiteit Amsterdam, The Netherlands

Homepage and Discussion Forum:

<http://www.isbweb.org/~tgcs/>

Technical Group Three-Dimensional Analysis of Human Movement

The Technical Group on the 3-D Analysis of Human Movement provides a forum for the discussion of all issues relating to the measurement of human movement in three dimensions. This is achieved primarily through the organization of international symposia, typically every second year. The Group primarily owes its existence to the efforts of Paul Allard, who organized the first symposium in Montréal in 1991, and helped with the organization of the symposia in Poitiers (1993), Stockholm (1994) and Grenoble (1996). The formation of the group was also strongly supported by the late Herman Woltring. The International Society of Biomechanics recognized the organization as a Technical Group in 1995. The first organizational meeting was held in Grenoble on July 1, 1996. Following symposia were held in Chattanooga / USA (1998), Cape Town / South Africa (2000), and Newcastle / England (2002). The Eighth Symposium takes place this year in Tampa, Florida, USA, from March 31-April 2, 2004 and is organized by Georgios Stylianides.

Next Symposium

The Ninth International Symposium on the 3-D Analysis of Human Movement is planned for

Valenciennes, France in 2006 and will be organized by Franck Barbier and the Laboratoire d'Automatique, de Mécanique et d'Informatique Industrielles et Humaines (LAMIH). No dates have been finalized yet.

Executive Board:

President: Georgios Stylianides University of South Florida, Tampa, USA

President elect: Franck Barbier, Université de Valenciennes, France

Past president: Garth Johnson University of Newcastle / UK

Treasurer: Paul Allard, Université de Montréal / Canada

Member at large: Chris Baten, Roessingh Research & Developm., Enschede, Netherlands

Member at large: Arne Lundberg, Karolinska Institute, Huddinge, Sweden.

Industry Representative: Peter Meddings, Vicon Motion Systems, Lake Forest, CA, USA

Industry Representative: Tom Whitaker, Motion Analysis Corp., Santa Rosa, CA, USA

Webmaster: Michael Whittle, University of Tennessee, Chattanooga, TN, USA

Homepage:

<http://www.utc.edu/Human-Movement/>

Technical Group on Footwear Biomechanics

The ISB Technical Group on Footwear Biomechanics provides a forum for those interested in biomechanical aspects of clinical, athletic and other kinds of functional footwear. Research in the area of footwear biomechanics has grown over the last 30 years. It started with several symposia in the late 1970s and early 1980s. These symposia were held in Zürich, Switzerland (1978 and 1980, organized by Benno Nigg), Nijmegen, Netherlands (1982, organized by Ned Frederick) and Calgary, Canada (1983, organized by Benno Nigg). Then Bernhard Segesser (Switzerland) and his colleagues who three symposia under the title: „Der Schuh im Sport“ in Munich, Germany

(1984), Luzern, Switzerland (1991), and Linz, Austria (1994). The group on Footwear Biomechanics was informally established as a Working Group on Functional Footwear in July 1993 during the XIV Congress of the International Society of Biomechanics in Paris. During the World Congress on Biomechanics in Amsterdam (1994) researchers, interested in Footwear Biomechanics gathered together and thanks to the initiative of Martyn Shorten (Portland) this was the start of the "ISB Technical Group on Footwear Biomechanics". In August 1997, the ISB Council granted the group formal status as the ISB Technical Group on Footwear Biomechanics. The six previous Symposia of this group were held in Calgary, Canada (1994), Cologne, Germany (1995), Tokyo, Japan (1997), Canmore, Canada

(1999), Zuerich (2001), and in Queenstown (2003). Online abstracts for the last symposia in Canmore and Zuerich are available through the homepage of the ISB Technical Group on Footwear Biomechanics. Online access to the Queenstown abstracts will be provided in the near future.

Next Symposium

The 7th ISB Technical Group on Footwear Biomechanics will be in 2005 as a satellite meeting to the ISB meeting in Cleveland, Ohio, USA. Joe Hammil, Keith Williams and Brian Davis will organize the symposium. The tentative date for this symposium is July 28-30.

Executive Board:

CHAIRMAN: Keith Williams, University of California, Davis USA

SECRETARY GENERAL: Mark Lake, Liverpool John Moore's University, Liverpool, UK

BOARD MEMBERS:

Ewald Hennig, University of Duisburg-Essen, Germany

Yasunori Kaneko, Mizuno Corporation, Japan
Geza Kogler, Southern Illinois University, School of Medicine, USA

Darren Stefanyshyn, University of Calgary, Canada

Bart Van Gheluwe, Free University, Brussels, Belgium

Homepage and Discussion Forum:

<http://www.staffs.ac.uk/isb-fw/>

International Shoulder Group (ISG)

The International Shoulder Group aims to enhance shoulder research by creating a platform for discussion and exchange of information. The ISG has started at the Congress of the International Society of Biomechanics at UCLA (Los Angeles) in 1989 and is officially a Technical Group of the International Society of Biomechanics since 1999. The ISG aims to enhance shoulder research by creating a platform for discussion and exchange of information. To this end, regular meetings are organized. In addition, the ISG strives to create a platform for exchange of software and data.

The goal of the group is to enhance shoulder research by exchanging ideas, methodologies, data, and results. This is achieved by regular meetings, exchanges of preprints and theses, and exchanges of researchers. The International Shoulder Working Group had their inaugural meeting at the XVI ISB Congress in Jyväskylä 1995. They conducted a first Scientific Conference August 26-27, 1996 in Delft,

Executive Board:

Netherlands, as an official pre-conference to the ISB Congress.

Proceedings of the second conference of the ISG organized as an satellite meeting of the ISB Congress, held in Calgary, August 1999 were published as a special issue in *Clinical Biomechanics*, Volume 15(S1), 2000. The third conference of the ISG was held in Newcastle upon Tyne, 4-6 September 2000. The fourth conference of the ISG, was organized in Cleveland, Ohio, 17-18 June 2002. Proceedings from both conferences are available on the technical group's website.

Next Symposium

The 5th Conference of the International Shoulder Group will be held in 2004 from August 27-28 in Lisbon, Portugal. It will be organized by Augusto Gil Pascoal from the Technical University of Lisbon.

PRESIDENT: Christian Hogfors, Chalmers University of Technology, Sweden

SECRETARY/TREASURER: Dirk Jan Veeger,
Vrije Universiteit Amsterdam, the Netherlands

MEMBERS:

Bob Kirsch, Case Western Reserve University,
Cleveland (OH), USA

Paula Ludewig, The University of Minnesota,
Minneapolis (MN), USA

Frans van der Helm, Delft University of Tech-
nology, the Netherlands

ACKNOWLEDGEMENTS: Peter Bruegge-
mann, previous officer of the ISB council as well
as the chairman of the technical groups provided
valuable information for this article. Further in-
formation was also collected from the home
pages of the ISB technical groups.

Ewald M. Hennig, February, 27th 2004

Homepage:

<http://www.wbmt.tudelft.nl/mms/dsg/intersg/iscg.html>

AGENDA for the International Society of Biomechanics Executive Council Meeting

's-Hertogenbosch, The Netherlands
9.00 am – 6.00 pm July 3rd & 9.00 am – 4.00 pm July 4th 2004

1. Welcome by the President
2. Minutes for the ISB Executive Council Meeting in Canada
3. Reports from Council Portfolios:
 - (a) President (*Mary Rodgers*)
 - (b) Past President (*Sandra Olney*)
 - (c) President Elect (*Brian Davis*)
 - (d) Education (*Alex Stacoff*)
 - (e) Informatics (*Joe Hamill*)
 - (f) ISB2005 Awards (*Maarten Bobbert*)
 - (g) NAC/Miyashita Awards/Asian Sponsorship (*Senshi Fukushima*)
 - (h) Constitution & Codes (*Robert Gregor*)
 - (i) Sponsorship Update (*Mark Grabiner*)
 - (j) ISB2005 Tutorials (*Walter Herzog*)
 - (k) Developing Countries/Affiliated Societies (*Jill McNitt-Gray*)
 - (l) Technical Groups (*Ewald Hennig*)
 - (m) Treasurer/Membership (*Graeme Wood*)
 - (n) Publications Officer (*Karen Søgaard*)
 - (o) Student Representation (*Motoshi Kaya*)
4. Constitution & Codes:
 - (a) Amendments to the ISB Constitution (*Julie Steele*)
 - (b) Involvement of a Student Representative on the ISB Executive Council (*Mary Rodgers*)
5. ISB Congresses
6. Other Business

International Society of Biomechanics

Amendments to the ISB Constitution – January, 2004 Voting Results

Amendment	Yes (No.)	No (No.)	Abstained (No.)	Illegal* (No.)	Total (No.)
1 Remove mail restrictions	128 (99.2%)	1 (0.8%)	0	0	129 (100%)
2 Rename Newsletter Editor	125 (96.8%)	3 (9.6%)	1 (0.8%)	0	129 (100%)
3 Representation in President absence	128 (99.2%)	0 (0%)	1 (0.8%)	0	129 (100%)

* A vote was deemed illegal if both the YES and NO boxes were ticked.

A total of 129 voting papers were received by December 20th 2004. The votes were counted by Julie Steele, ISB Secretary-General and audited by ISB member, Bridget Munro. The results of the votes are detailed below:

Based on these results it is declared that:

Amendment 1: to remove mail restrictions for voting method is accepted. Therefore, Article 5 and 6 will now read:

5.8 Decisions of the Council shall be made by a simple majority of the Council members present at the meeting, or if voting by other means, by a simple majority of the respondents. A quorum shall consist of at least 3/4 of its members.

6.3 The membership shall elect by secret ballot at two year intervals the President-Elect and the Council Members. The Past-President is responsible for soliciting nominations and preparing the official ballot.

6.3.1 Nominations shall be made by the members and the election shall be by secret ballot.

6.12 Written motions to amend the Constitution shall be submitted to the Council and distributed to all members for decision which shall require a simple majority of all ballots returned to the Secretary-General. Notice of the results shall be given to all members, where upon the amendment will become effective.

Amendment 2: to rename the Newsletter Editor to Publications Officer is accepted. Therefore, Article 5 will now be reworded to:

5.1 A President, President-Elect, Past-President, Council Members representing various disciplines in biomechanics, and a Student Representative shall constitute the Executive Council. A Treasurer, Secretary-General, and Publications Officer are appointed officers with approval of the Council.

Amendment 3: Representation in the absence of President is also accepted. Therefore, article 6 will now read:

6.2 The General Assembly is presided over by the President of the Society or, if absent, by the Past-President or other member of Council appointed by the President.

Julie R Steele, PhD
ISB Secretary General, February 26th 2004

Welcome to the Japanese Society of Biomechanics: JSB

As many of the approximately 1000 JSB members are also members of the ISB, ours has consistently been one of the largest delegations at the biannual ISB congress. The delegates attending the early years of the ISB Congress were primarily organized by Dr. Miyashita: 'SHOGUN', an honorary member of the ISB.

The JSB was established in 1972, around the same time as the ISB. The JSB has held a congress every two years since its inaugural year. This year's congress will be the 19th. The JSB was a separate organization until 1993, at which time it became a sub-member of the ISB. This change was organized by Dr. Kaneko, the former president of the JSB. Even before our official affiliation status, we had sent an executive member to each ISB council. The ISB congress was held twice in Japan, Nagoya in 1981 and Tokyo in 1997. The JSB published the Japanese Journal of Sports Sciences (JJSS) monthly from 1982 to 1997, and has been publishing quarterly the Japanese Journal of Biomechanics in Sports and Exercise (JJBSE) since 1997 (<http://www.htc.nagoya-u.ac.jp/jjbse/>). The JJBSE, as well as the JJSS before it, is a refereed journal where biomechanists from foreign countries are welcome to submit papers for publication.

In the early period of the JSB, Japanese biomechanists focused on studying the kinematics and kinetics of basic human motions such as walking, running, throwing, etc. At present, the main goal of the JSB is to research the mechanisms of human movement primarily by using inverse dynamics with EMG and computer simulation. One of our major research developments has been the use of ultrasound to analyze the behavior of the muscle-tendon complex in humans. This method is extremely useful for non-invasive *in vivo* research. Based on this new technique, Dr. Fukunaga, the current president of the JSB,

was awarded the Muybridge Medal at the NZ ISB congress in 2003. The basic types of research mentioned above are developed extensively in each laboratory in Japan, but they are not limited to only academic settings. These research results and techniques can be applied to elite athletes for improving the performance at the national training center: Japan Institute of Sports Sciences. Being an Olympic year, we are hopeful that our efforts will help Japanese athletes achieve excellent results, particularly in track and field, swimming and combative sports.

For the last several years, we have been expanding our horizons through collaborative research with other disciplines within Japan, including biochemistry, medicine, engineering, neuroscience, etc. In the future, as research becomes more internationalized, we will work more with foreign organizations through government and private funding initiatives. We look forward to combining our research techniques and ideas with those developed in other countries to further our understanding of the mechanisms of human movement. The following Haiku poem I wrote sums up our society's future goals nicely:

*JSB with ISB
will be able to optimize together
future Biomechanics*

<http://www.isbweb.org/notisb/haiku.html>).

*Senshi Fukashiro, Ph.D.
(Appointed Officer)*

*Please join us in Japan for exciting research,
delicious food, and refreshing beer!*

James G Hay Travel Awards

From the Organising Committee of the XIXth ISB Congress, Dunedin, 2003.

Travel to ISB Congresses is becoming increasingly difficult and expensive for New Zealand biomechanists and their students because institutional support is reducing, and international costs are rising. Consequently, the XIXth Congress Organising Committee has used the surplus from the Congress to start a fund to support travel to future ISB Congresses by New Zealand biomechanists and student biomechanists.

The fund will commemorate Jim Hay, a former President of ISB, and the progenitor of the New Zealand sport biomechanics community, and the awards will be known as the James G. Hay Travel Awards. The awards will be administered by the Royal Society of New Zealand, and, should they ever be wound up, the residue will be vested in the ISB.

The income from the capital investment will be fully utilised every 2 years to provide travel assistance for New Zealand biomechanists who qualify for the award to travel to ISB to present a paper. Recipients will be required to report on their experience, and wherever possible, present the work in an appropriate New Zealand forum. The first award(s) will be made next year for the XXth Congress in Cleveland. An announcement will be made soon on the eligibility criteria and application procedure and timing for the travel award.

The Organising Committee would like to express its gratitude to the ISB Council for allowing the use of the Congress surplus to set up the Awards, and to all those hardy souls who made the trek to "Middle Earth" in mid-winter and so made the establishment of the Fellowship to commemorate Jim Hay a reality. It will serve as an enduring legacy of Jim's contribution to the international biomechanics community.

Alan Walmsley, Co-convenor, ISB XIX Organising Committee



ISB Student Travel Award Report

Peter Mills

I would like to thank the International Society of Biomechanics Executive Council for awarding me with an ISB Congress Travel Grant in 2003. The grant enabled me to travel to the 2003 ISB Congress in Dunedin and present results from my PhD research. The feedback that I received following my presentation was extremely valuable and has strengthened my doctoral research.

While working on a specific PhD research project it is easy to lose sight of the bigger picture. My attendance at the ISB Congress in Dunedin provided me with the opportunity to sit in on a number of presentations that covered topics outside of my usual scope of review. I was extremely interested in some of the papers that illustrated the application of recent technological advances. In particular, the Muybridge Lecture presented by Professor Fukunaga will stay in my

memory for years to come. I also had the opportunity to attend Dr. Dapena's tutorial on 3D Rotational analysis which has strengthened my understanding in this area.

For me, one of the major benefits of attending the ISB Congress was that I had the opportunity to develop and strengthen links with individuals and groups with similar research interests. The Congress Organizers provided many opportunities for this to occur, both at the congress venue during the poster and trade exhibit sessions, and at organized events such as the student breakfasts and the Congress banquet.

This was my first ISB Congress but certainly will not be my last. I came away from the Dunedin Congress feeling both stimulated and inspired. I thoroughly enjoyed my experiences at the ISB Congress in Dunedin and would like to express my appreciation to the ISB for their assistance.

Peter Mills
The University of Western Australia, Australia

ISB Congress Travel Grant Report
Huub Maas

I would like to thank the ISB for the opportunity to travel to the XIXth ISB congress held in Dunedin, New Zealand. This very valuable experience would not have been possible without the financial support provided by the ISB.

In two weeks (October 16, 2003) I will defend my thesis entitled "Myofascial force transmission: intra-, inter- and extramuscular pathways" in order to receive my Ph.D. degree at the Faculty of Human Movement Sciences in Amsterdam. I performed my research within the group of Prof. Peter Huijing. We have investigated the pathways via which force, that is generated within the muscle fibers, is transmitted to bone. Recent experiments in our laboratory have revealed unequivocal evidence that muscle fiber force is also transmitted out of the muscle via pathways other than the tendons: via intermuscular connective tissue, force is transmitted to adjacent muscles (i.e. intermuscular myofascial force transmission); via extramuscular connective tissue, muscle force is transmitted directly onto bone (i.e. extramuscular myofascial force transmission).

Thursday morning the 10th of July, I presented some new data on force transmission from multi-tendoned muscles. It was an interesting session on Muscle Force Production. This was the second time I gave an oral presentation at an International Congress and every time it costs me less energy and I am less nervous. In addition to my own paper, there were several other stimulating presentations related to muscle mechanics but also non-related ones. Furthermore, I have spoken to many colleagues working in the field of Biomechanics. Contact with other researchers in the world, discussions about experimental results makes the ISB congress an indispensable event.

I would like to thank the organizing committee for a valuable experience and a lot of good food. In addition to the scientific part, I enjoyed my time in Dunedin. Especially the penguins I will never forget. This made the awfully long trip from Amsterdam to Dunedin worthwhile.

Huub Maas
Faculty of Human Movement Sciences
Vrije Universiteit Amsterdam

ISB Congress Travel Grant Report
Jeremy M. LaMothe

I would like to thank the ISB for awarding me one of the Student Congress Travel Grants. With this grant, I was able to travel to the International Society of Biomechanics XIXth Congress (July 1-11th, 2003) in Dunedin, New Zealand. I would also like to thank the conference organizers for creating an enjoyable and memorable atmosphere. From the opening Maori cultural performance to the closing banquet, everything was superb.

At the Congress I presented two pieces of research, one podium and one poster. My podium presentation was titled "*Strain rate directs bone adaptation*", and was a chapter of my doctoral dissertation. For this presentation, I was awarded the 2003 ISB Young Investigator Award for best podium presentation. I am especially grateful to the audience at this presentation for posing stimulating questions. I have effectively designed and conducted further studies from these questions. Concurrent to my doctoral research, I have studied the effects of a variety of dietary paradigms on bone health. My poster presentation was one of these studies and was titled "*Age and caloric restriction affect axial and appendicular bone morphology and mechanics differently*". Aside from the sessions my presentations were in, I attended sessions and keynote lectures both specific and tangential to my research field. From these sessions I gained facts and methodological ideas specific and anecdotal to my current research. I will synthesize and utilize these ideas in future research.

Accessory to the key influence the ISB Congress had on my research career, the extracurricular activities I was able to engage in were fantastic. This was my first visit to New Zealand. Thus, I extended my stay after the Congress in New Zealand with four fellow graduate students from the University of Calgary. We toured the Royal Albatross Centre on the Otago Peninsula, Queenstown, and the Coromandel Peninsula.

The ISB Student Congress Travel Grant made my trip to New Zealand possible. In New Zealand, I experienced both academic and personal. For these growths, I am thankful to the ISB.

Jeremy M. LaMothe
University of Calgary, Alberta, Canada



**ISB Congress Travel Grant Report
Prism Schneider**

I wish to take this opportunity to express my sincerest gratitude for being given the opportunity to attend the International Society of Biomechanics (ISB) XIXth Congress in Dunedin, New Zealand this past summer. I was able to venture to this prestigious conference in large part due to receiving the ISB Congress Travel Grant Award.

As a result of being awarded this distinction, I was able to give a podium presentation entitled, *Time-Frequency Analysis Of Myoelectric Signals From Children With Cerebral Palsy: A New Muscular Co-Contraction Assessment Technique*, in the Paediatric Pathological Gait session of the conference. I was also given the opportunity to present a poster entitled *Controlling Centre Of Mass Momentum In Sit-To-Stand After Epidural Analgesia Infusion*. As a new researcher, these were both valuable experiences. Both opportunities allowed me to improve my presentation skills and receive feedback for each study. I was also able to engage in many discussions regarding my research findings and pertinent research by others in these areas. I was able to present my research findings to an international audience, as well as attend numerous presentations by colleagues. As a result, I was able to convey our current research, meet the leading experts in various biomechanical disciplines and also engage in intellectually stimulating discussions about currently debated topics. Not only was I able to present my research on the international stage, but I was also able to receive excellent suggestions and support for continued research in these areas. I was able to foster professional relationships with successful leading researchers as well as fellow new researchers in my field. Familiarizing myself with the current biomechanical research community and the resources that other facilities have to offer will undoubtedly prove useful in the future. This experience was both educational and inspiring. Daily interactions with fellow biomechanists were truly motivating, as questions were both answered and raised. I was able to gain new perspective on the value of my contribution and realized the extent of my pride in being a new member of this research community. I have also gained appreciation for the importance of knowledge transference that is fostered by such international conferences.

In closing, I would like to once again thank the ISB Council for affording me this educationally rewarding opportunity and express my excitement for continued work in the field of biomechanics.

*Prism Schneider University of Calgary, Alberta,
Canada*

**ISB Congress Travel Grant Report
Keith Gordon**

I would like to express my sincere gratitude to the ISB council for presenting me with a 2003 ISB congress travel grant. The funding allowed me to attend the XIX Congress of Biomechanics in Dunedin, New Zealand. Attending the congress was a wonderful learning experience for me.

I was impressed by the scope and diversity of the congress. In particular I really enjoyed the keynote and award addresses. I found Alberto Minetti's talk of great interest because of its relevance to my own area of research. However, the two presentations that excited me the most were not those most closely related to my immediate research interests. The breadth of Thomas Brown's research to develop a viable animal model of the hip amazed me. As well, I was fascinated by the innovative techniques Tetsuo Fukuaga is using to explore muscle mechanics *in vivo*. What impressed me about both these talks was the ability of the researchers to develop novel techniques that allowed them to study the particular biomechanics questions that they were interested in.

I also received a tremendous amount of positive feedback on my poster presentation. This was one of the first times I have been able to present this work to the biomechanics community so I was very interested in feedback. The fascinating questions and constructive comments I received have motivated my research efforts, and opened my eyes to alternative views on the research. At the end of the conference I received the Young Investigator Award for my poster presentation. This was a great honor. I was thrilled by the level of interest and praise given to my research efforts.

In addition, the congress provided an incredible opportunity for me to meet and converse with some incredibly bright and interesting people. I enjoyed many of the social aspects of the conference, from the student pub-crawl to the informal lunches and teas. It was nice to finally meet the people whose work I have read about. I look forward to seeing them again at future meetings and possibly collaborating with some in the future.

Thank you once again for providing me with funding to attend this conference. I am very grateful that I had this opportunity. Additionally, I would like to also thank the organizing committee for putting together a fine program, and all of our very accommodating hosts at the University of Otago.

*Keith Gordon
Human Neuromechanics Laboratory
University of Michigan, USA*

Puzzle:

Calculating precession with Newton's second law – too simple to be true?

Submitted by W. Lutz Bauer (University of Bremen, 11. February 2004)

The gyroscope of Fig. 1 which is rotating with angular velocity ω , is supported at one end without friction. Its axis swings around O in a horizontal plane with constant angular velocity ω_p in a motion called precession. The horizontal rod is weightless, the moving coordinate system xyz is fixed to the gyroscope and the xy -plane remains horizontal. The total mass of the gyro is concentrated in an outer ring which consists of mass elements dm . At $t = 0$ the mass element dm in question is positioned on the z -axis, its position angle to the z -axis is $\varphi = 0$ and the angle of the y -axis to the fixed coordinate system y' is $\varphi_p = 0$. a_y is the acceleration of the mass element dm in the direction of y due to the gravitational torque τ .

- r = moment arm of the force F
- τ = torque produced by force F
- a_y = acceleration in y direction
- g = gravitational acceleration
- m = mass of the gyroscope
- v_y = velocity in y direction
- xyz = moving coordinates

- dF_f = centrifugal force
- dm = mass element
- I = moment of inertia
- L = angular momentum
- $dm \cdot a_y$ = negative inertial term (D'Alembert's principle)
- Fr_{ay} = resultant inertial force

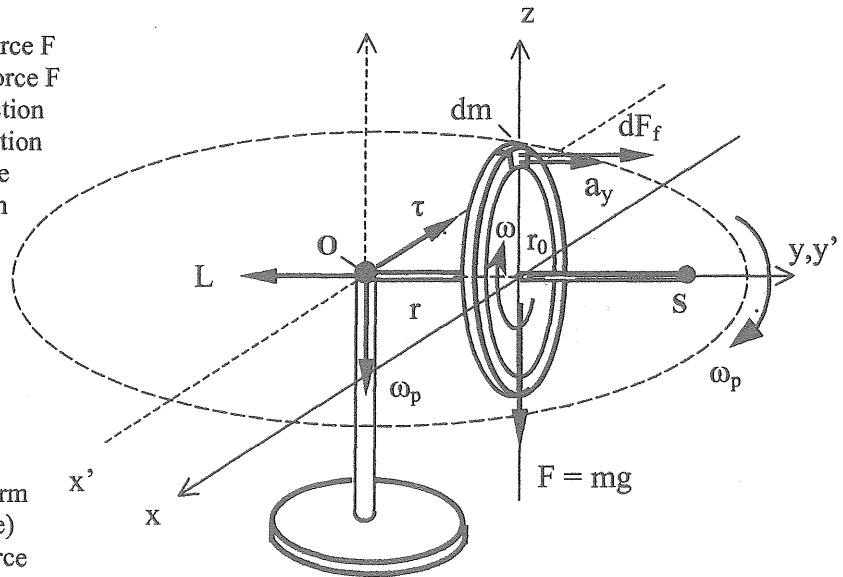


Fig. 1: Gyroscope with precessional motion ω_p

To find the mechanical equation $\Sigma M = 0$ about O of the mass element dm using Figure 2 and 3 and apply d'Alembert's principle yields:

$$rdF \cos \varphi + r_0 dF_f - a_y r_0 dm = 0 \quad (1)$$

The centrifugal force dF_f does not affect the angular velocity ω_p because the gyro is symmetrical. Thus dF_f can be omitted. With $dF = dm g$ and $\varphi = \omega t$ and rearranging we obtain

$$\int_0^{\varphi} a_y dt = \int_0^{\varphi} g \frac{r}{r_0} \cos(\omega t) dt \quad (2)$$

Solving by integration we get

$$v_y(\varphi) = \frac{gr}{\omega r_0} \sin \varphi \quad (3)$$

From Figure 4 we have

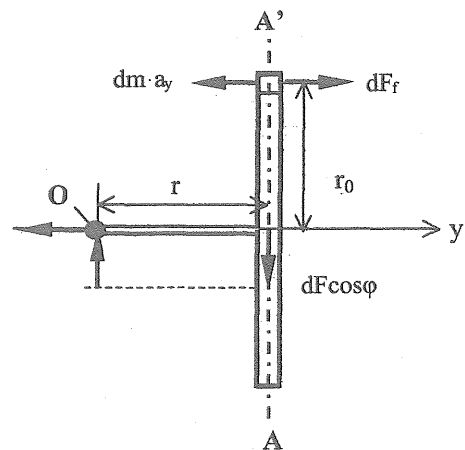


Fig. 2: View of the A'A y -plane – dm positioned at φ

$$v_y(\varphi) = \omega_p r_0 \sin \varphi \quad (4)$$

substituting (4) in (3) then

$$\omega_p = \frac{gr}{\omega r_0^2} \quad (5)$$

When multiplying numerator and denominator with dm and integrating we find the precessional motion as

$$\omega_p = \frac{\int g r dm}{\omega \int r_0^2 dm} = \frac{mgr}{I\omega} \quad (6)$$

a solution well known.

From equation (2) and (3) we get

$$a_y = g \frac{r}{r_0} \cos \omega t \quad (7)$$

$$s_y = \frac{gr}{\omega^2 r_0} (1 - \cos \omega t) \quad (8)$$

Each mass element dm of the gyro does harmonic oscillations in the direction of y with a frequency f and an amplitude \hat{s} of

$$f = \frac{\omega}{2\pi} \quad (9)$$

and

$$\hat{s} = \frac{gr}{\omega^2 r_0} \quad (10)$$

respectively.

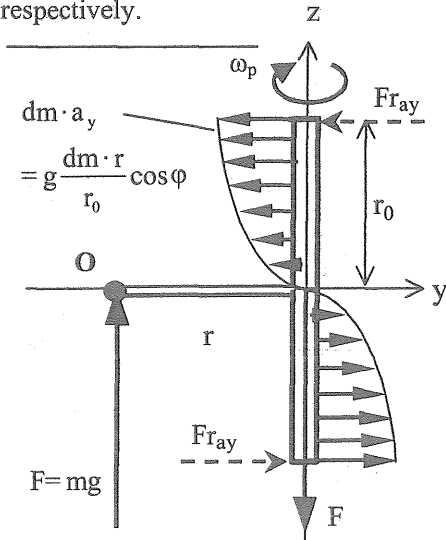


Fig. 5: Distribution of the inertial terms $dm \cdot a_y$ on the circumference (yz-plane) and their resultant inertial force Fr_{ay}

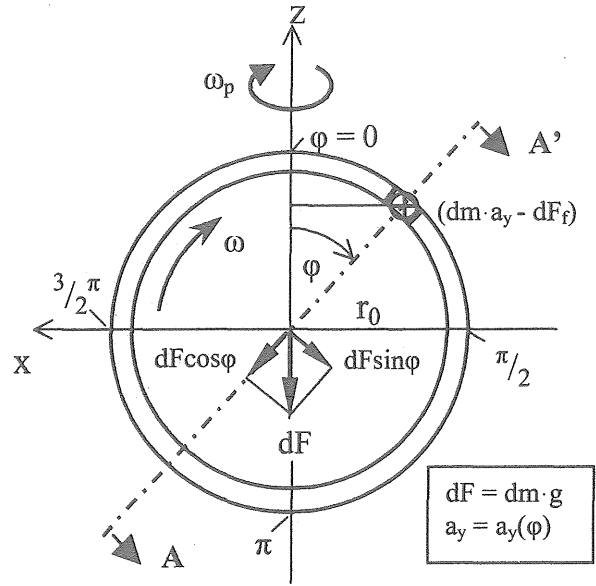


Fig. 3: View of the xz-plane - dm positioned at φ

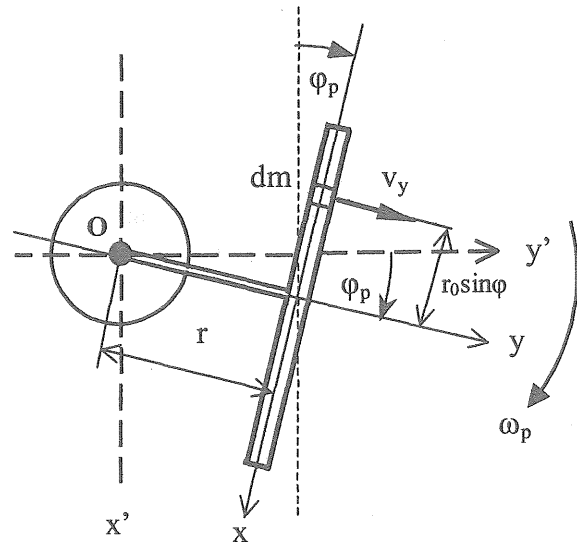


Fig. 4: View of the xy-plane upon rotation of the gyro with an angle φ

Thus each spinning mass element dm is accelerated back and forth as a function of time in the direction of y , thus creating the reaction forces – inertial terms $dm \cdot a_y$ – which compensate the gravitational torque and moving the gyro in a horizontal plane.

At any instant of time the distribution of the inertial forces on the circumference of the gyro as a function of φ is constant (Fig 6)

Questions:

1. Define the total energy of the system.
2. Describe the effects when ω approaches 0 and ∞ respectively in Equ.(6).
3. What happens when point S in Fig. 1 slides on to a smooth frictionless horizontal surface without lifting the center of gravity and thus the torque τ suddenly becomes zero?
4. Prove mathematically that the centrifugal force dF_f can be omitted without affecting the result of Equ.(6)
5. Verify that $r_0 \int_0^{2\pi} a_y dm = mgr$
6. In Fig.5 the centrifugal force dF_f is not included. Thus $\Sigma M = 0, \Sigma F_x = 0, \Sigma F_y = 0$ and $\Sigma F_z = 0$ without it. Does that mean the centripetal force at the point of support will be zero?
7. Describe the dynamic response of the gyro when - a) g is suddenly doubled, b) g is suddenly made to zero with a drop tower experiment. (use Equ. (6))

8. Show that
$$F_{r_{ay}} = \int_{-\pi/2}^{\pi/2} a_y dm$$

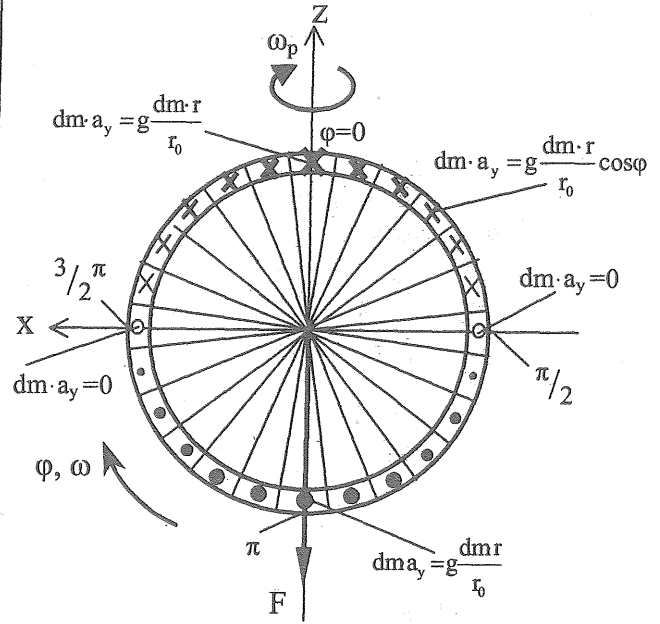


Fig. 6: Distribution of the inertial terms on the circumference in the xz-plane. In the upper half of the gyro the horizontal forces point into the paper plane, in the lower half of the gyro the horizontal forces come out of the paper plane. (Small dot/cross = small force, large dot/cross = large force)

New Nike Award for Athletic Footwear Research

Nike will sponsor a prize of UD\$25,000 on a biannual basis to encourage research on the role of athletic footwear in the prevention of chronic sport injuries. The prize will be granted for the first time at the meeting of the ISB Footwear Biomechanics Technical Group to be held in conjunction with the 2005 ISB congress.

The prize will be awarded competitively on the scientific merit of the work*. A panel of experts from the field will be assembled to determine the winner of the award. Full papers containing original material, not previously submitted for publication, should be in the form of a scientific report in the English language. The papers must be received no later than May 1, 2005.

Full details for submission will be available on the ISB website (www.isbweb.org).

*Note that research sponsored by Nike will not be eligible for this award.

Mario Lafortune

Upcoming Meetings, Workshops

2004

AP Biomech 2004
First Asian Pacific Conf. on Biomechanics

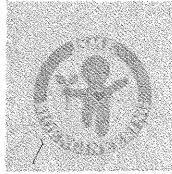
Dates: March 25-28, 2004

Venue: Osaka University, Osaka, Japan; Mechanical and Bioengineering Systems Lab.

Information:

E-mail: apbiomech@me.es.osaka-u.ac.jp

See website: <http://apbiomech.me.es.osaka-u.ac.jp/>



ESB 2004

The 14th European Society of Biomechanics conference

Dates: July 4-7, 2004

Venue: 's-Hertogenbosch

Eindhoven University of

Technology, Department of Biomedical Engineering,
P.O. Box 513, 5600 MB Eindhoven, The Netherlands

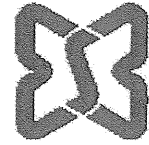
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Fax: + 31 40 24 47 355

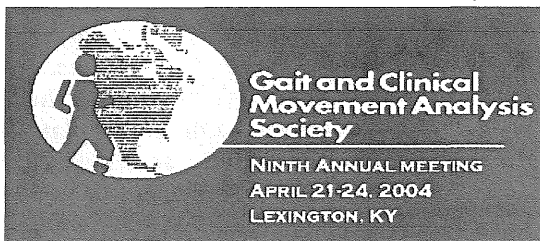
Information:

E-mail: esb2004@tue.nl

See website: <http://www.esb2004.tue.nl>



GCMAS IX



Gait and Clinical Movement Analysis Society
Annual Meeting

Dates: April 21-24, 2004

Venue: Hyatt Regency and Lexington Convention Center, Lexington, Kentucky, USA

Information:

See website: <http://www.amrinc.net/gcma/index.cfm>

ICVPB 2004 Marseille



International Conference on Voice Physiology and Biomechanics

Dates: August 18-20, 2004

Venue: Marseille (France)

Information:

E-mail: agiovann@ap-hm.fr

See website: <http://icv2004.free.fr>

ISEK XV
International Society of Electrophysiology and Kinesiology

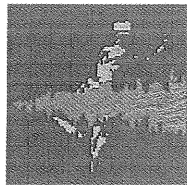
Dates: June 18-21, 2004

Venue: Boston University, Boston, MA, USA

Information:

E-mail: Dr. Serge Roy, sroy@bu.edu

See website: <http://isek2004.bu.edu/>



CSB XIII

Canadian Society for Biomechanics / Société canadienne de biomécanique

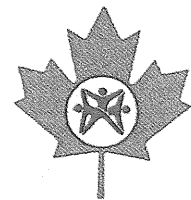
Dates: August 4-8, 2004

Venue: Westin Hotel, Halifax

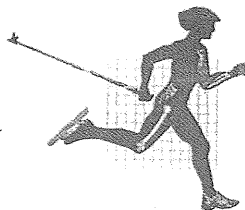
Information:

Contact: Dr. Cheryl Kozey, Dalhousie University, Halifax, clk@dal.ca

See website: <http://www.csb2004.ca>



ISBS XXII
International Society of
Biomechanics in Sports
Dates: August 9-12, 2004
Venue: University of Ottawa
 Ottawa, Ontario, Canada
Information:
 E-mail:



ISBS2004@uottawa.ca
 See website: <http://www.health.uottawa.ca/isbs2004/>

5th Triennial International Hand & Wrist Biomechanics Symposium

Dates: September 7, 2004
Venue: Syracuse, New York
Information:
 E-mail: wernerf@upstate.edu
 See website:



<http://www.upstate.edu/ortho/handmtg.htm>

American Society of Biomechanics, Annual Meeting **Dates:** September 8-11, 2004
Venue: The Lloyd Center Ballroom
 Doubletree Lloyd Center Hotel
 Portland, Oregon



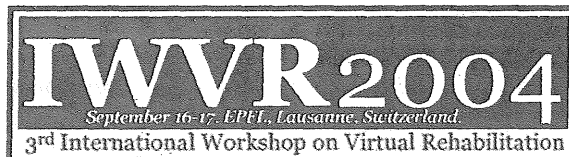
Information:
 Email: Dr. Michael Bootlang, mbootlang@lhs.org
 See website:
<http://www.legacyhealth.org/healthcare/research/asbcnf.ssi>

5th Conference on Engineering of Sport

UCDAVIS

Dates: September 13-16, 2004
Venue: University of California, Davis
 Sponsored by International Sports Engineering Association and Bioengineering. Division of ASME
Information:
 See website: <http://conferences.ucdavis.edu/sportengr>

Third International Workshop on Virtual Rehabilitation



Dates: September 16 and 17, 2004
Venue: EPFL, Lausanne Switzerland,
Information
 Email: Daniel Thalmann and Greg Burdea, Cochairs,
2004@iwvr.org
 See website: <http://www.iwvr.org>

2005

ISB XX
International Society of Biomechanics Congress

Dates: 1-5 August 2005
Venue: Cleveland, Ohio, USA
Information:
 E-mail: info@isb2005.org
 See website:
<http://www.ISB2005.org>



ISPGR XV
International Society for Postural and Gait Research

Dates: tba
Venue: Marseille, France.
Conference Hotel: tba
Information:
 Dr. C. Assisante
 See website: <http://www.ispgr.org/index.html>



2006

5th World Congress of Biomechanics
Dates:, 29 July – 4 August 2006.

Venue: Munich, Germany
Information:
 Email: Prof. Dr.-Ing. habil. Dieter Liepsch,
info@WCB2006.org
 See website:
<http://www.wcb2006.org/>

Munch, Germany - July 29 - August 4, 2006
V. World Congress of Biomechanics



Editors notes and request

Even though a former editor announced that there are no deadlines for the Newsletter since historically they have never been taken serious by anybody, I will try to announce that deadline for the summer issue of the Newsletter will be end of May!

This may be particular important for those wanting to respond on Lutz Bauer's puzzle! I will also take the chance to encourage especially the senior part of our society to get inspired by the current changes in the constitution and let us share their knowledge and memories

of the early days of the society, factual as well as anecdotic!

Any contributions in this area are welcomed and also suggestions of people who may be able to tell a good story in an interview.

For the not yet so senior members, get inspired by our presidents note do you have a story to tell about a mentor who made a difference?

Please send your contribution in electronic form in any form of English to ks@ami.dk

Karen Sogaard, Newsletter Editor

Membership News

New Members – as many listed as space permits – more next issue

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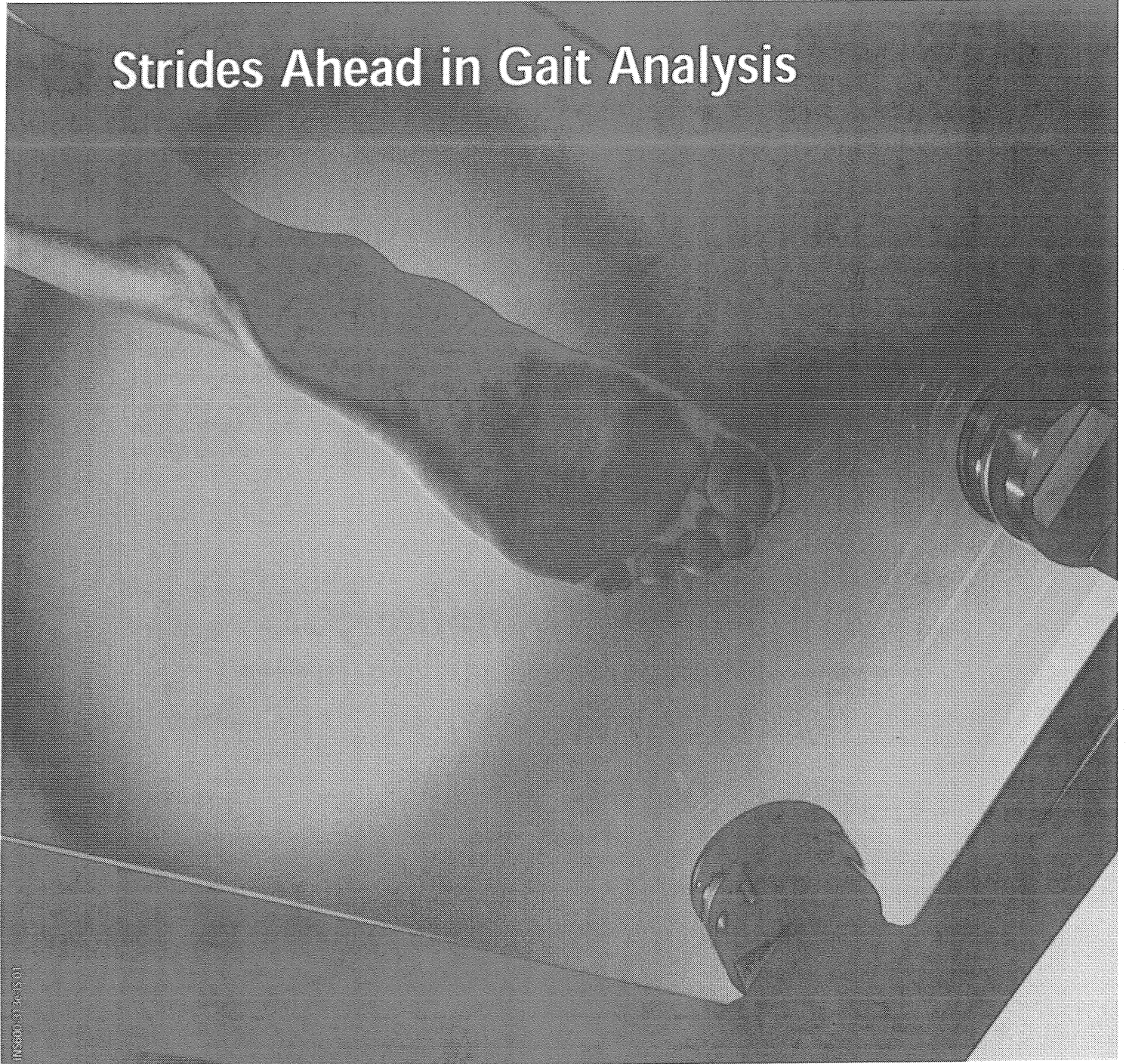
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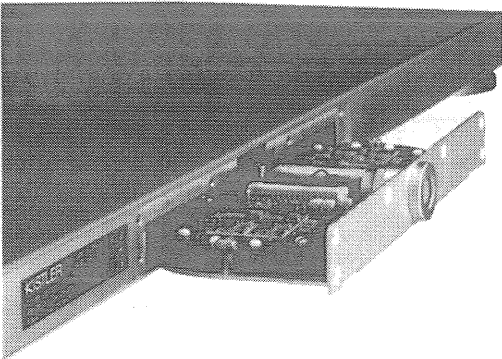
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