
Vol 4 No 2

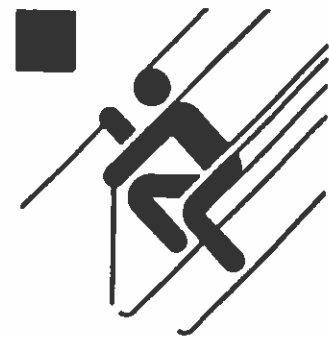
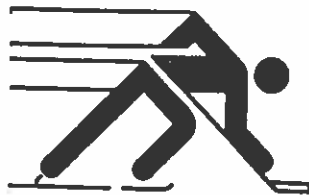
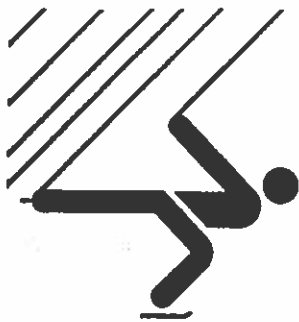
Fall 1987

SPORTS BIOMECHANICS

NEWSLETTER

I S B S

International Society



of

Biomechanics in Sports

SPORTS BIOMECHANICS NEWSLETTER
VOL 4 NO 2

FALL 1987

L. Holt, President
J. Hudson, Secretary General
J. Ostarello, Treasurer
H. Gros, Newsletter Editor

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Please send YOUR contribution to the next Newsletter to:

Dr. Hans J. Gros, Institut für Sportwissenschaft
Universität Stuttgart
Keplerstrasse 17
7000 STUTTGART 1
West Germany

DEADLINE: MARCH 15, 1988

FIFTH INTERNATIONAL SYMPOSIUM OF BIOMECHANICS IN SPORTS

On July 13th to 17th, 1987 the Fifth International Symposium of Biomechanics in Sports took place at the Stadium of Peace and Friendship in Athens, Greece. This facility is best known for hosting major competitions, like the European Championships in Wrestling, Track and Field, Basketball and Table Tennis but also features excellent congress facilities. The Symposium was organized by the Hellenic Sports Research Institute of the General Secretariat of Sports under the auspices of the International Society of Biomechanics in Sports.

The Symposium served as a unifying forum in light of the growing importance of Sports Biomechanics and aspired to bridge the gap between researchers and practitioners in the field. Contributions on the whole spectrum of ISBS (more than 100 papers and poster communications were submitted) helped the organizing committee to arrange an interesting scientific program. One of the scientific highlights was the "Geoffrey Dyson Memorial Lecture" presented by Prof. Hochmuth, Leipzig.

Researchers from different disciplines as well as coaches and teachers who share a common interest in Sports Biomechanics and its application came from 22 countries including: Australia, German Democratic Republic, Federal Republic of Germany, Japan, United States of America, Italy, Great Britain, Canada, France, Sweden, Poland, Belgium, Czechoslovakia, China, Hungary, Bulgaria, USSR, Yugoslavia, Portugal, Austria, The Netherlands, Denmark and of course Greece. The organizers are proud to report, that 30 participants came from eastern block countries.

The Symposium was absolutely successful but not only as far as the scientific aspect is concerned: The social program was simply "smashing". All participants had ample opportunity to enhance collaboration and friendship in the atmosphere of Greek hospitality. The Greek federations of Wrestling and Track and Field supported the program with receptions. After the Symposium the participants and accompanying persons had the opportunity to enjoy a three day excursion to Delfi and Ancient Olympia including a visit of the archeological sites and accomodation at the International Olympic Academy.

The great success of the Symposium and the contact of the participants with Greece will advance the National request of Greece for hosting the Golden Olympics of 1996.

ISBS and all the participants have every reason to express appreciation, thanks and congratulations to Dr. E. Tsarouchas and his team!

GUIDELINES IN THE SELECTION OF THE

GEOFFREY DYSON LECTURER

(This proposal was prepared by Barbara Gowitzke and was approved by the Board of Directors as well as the Annual General Meeting held in conjunction with the ISBS Symposium in Athens)

At the 1986 meeting in Halifax, it was agreed that guidelines for the selection of the Geoffrey Dyson Lecturer were needed and I was charged with the responsibility of preparing these. The following set of statements are submitted for your perusal and approval.

The most prestigious honor of the Society is the one accorded to the Geoffrey Dyson Lecturer. Accordingly, qualifications for selection should be high and the selection process should be rigorous. In naming this lecturer, the Society also assumes a financial responsibility to meet most of the expenses of the lecturer. This document will outline:

(1) the qualifications to be considered as a candidate for the Geoffrey Dyson Lecturer; (2) the selection process; and (3) the financial commitment of the Society.

(1) The qualifications for the Geoffrey Dyson Lecturer.

- The Candidate must have an international reputation in the field of sports biomechanics in keeping with the reputation of Geoffrey Dyson, himself, the man we honor.
- The candidate must have an interest in the applied nature of sports biomechanics and an ability to communicate with both the researcher and the practitioner (coach, teacher, athlete).
- A condition of acceptance shall be that the candidate personally deliver the Geoffrey Dyson Lecture.

(2) The selection process.

- A committee of three, headed by the President, comprises the selection committee. The Vice-President for Conferences and Meetings and the Vice President for Public Relations and Awards are the other two members.
- The committee shall solicit nominations for candidates from members of the Society, during the Summer and Fall of the year in advance of the Symposium. A selection shall be made no later than January of the year in which the symposium shall be held. Preferably, the Committee shall select a second candidate in the event that, for any reason, the nominee is unable to accept the honor.
- The selected candidate shall be notified in writing by the President, who shall outline the nature of the honor, duties involved, honorarium and the financial support provided.

(3) The financial commitment of the Society.

- The high esteem accorded to the lecturer carries with it responsibility on the part of the Society. It would be expected that the Society would fund the travel and accomodation expenses of the candidate. It is taken for granted that registration fees would be waived. In addition, an honorarium of \$100 U.S. should be available.

continued...

- It is recognized that the funding of the conference is somewhat distinct from the budget of the ISBS as an organization. However, a new and important component of the ISBS budget should be added to include funds for the Geoffrey Dyson Lecturer.
- It is suggested that the Geoffrey Dyson Lecturer might be appropriately funded by a sponsor.
- It is suggested that the lecturer be presented with an award.

YOUNG RESEARCHERS AWARD

(This proposal was submitted by Dr. Petr Susanka and approved by the Board of Directors)

The International Society of Biomechanics in Sports will encourage and support young researchers in the field of Sports Biomechanics by offering awards according to the following rules and guidelines:

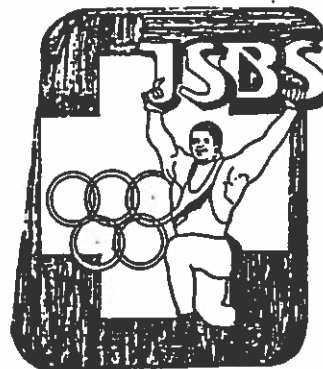
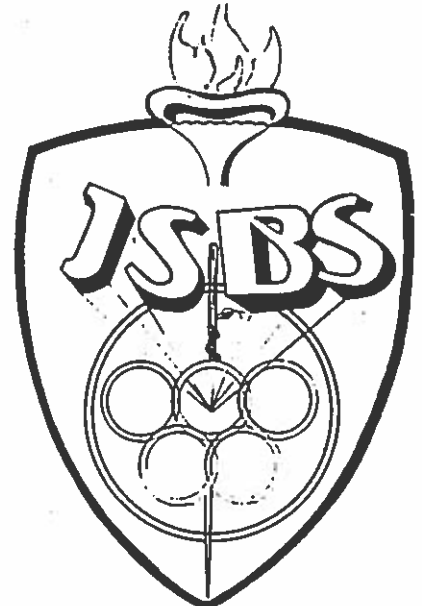
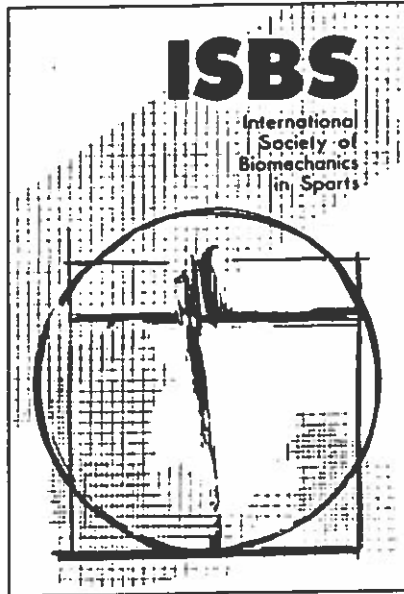
- Original Research presented in MA, MSc, Diploma Thesis (or equivalent) but no PhD Thesis are eligible.
- The thesis topic must be related to sports biomechanics.
- Each University or Institute may submit a maximum of two thesis per year.
- Three copies must be submitted and will be distributed to experts in different universities for independent evaluation.
- The top three thesis will be awarded a material price (valued at approximately 600 US\$ per person).
- The awards will be presented at the annual ISBS Symposium.
- The winners are expected to present their research at this time.
- The deadline for the receipt of all entries is April 1st.

Dr. Susanka has taken the responsibility for organizing all aspects related to the award for the first three years. Thus, if you have any questions or wish to submit a thesis please write to:

Dr. Petr Susanka
 Ujedz 450, Universita Karlova
 Biomechanics Laboratory
 PRAHA 1180-7
 Czechoslovakia

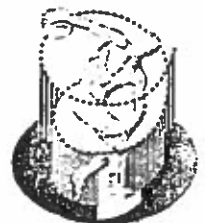
ISBS LOGO CONTEST

One of the many items on the agenda of this year's Board of Directors meeting was the selection of a LOGO for ISBS. As you know, the Logo contest was started with an announcement in the Newsletter Vol.3 No.2. The original deadline was extended (see: ISBS Newsletter Vol.4 No.1) and a number of promising designs could be presented to the Board of Directors in July. Here are some examples:



After some discussion it was decided that many of the entries have merit and could be adopted as a logo for ISBS but no single design found the unconditional approval of the Board. Hence it was decided to reopen the contest for another year. All ISBS members are asked to call on their artistic and creative potential to come up with the ultimate logo design. Please submit your entry (ies) no later than June 1st, 1988 to:

Dr. Hans Gros
IfS, Keplerstrasse 17
7000 Stuttgart 1
West Germany



DATA SMOOTHING : SELECTION OF A CUT-OFF FREQUENCY

by: Dr. Pierre Gervais, Department of Physical Education and Sports Studies, The University of Alberta, Edmonton T6G2H9, Canada.

One of the most common methods of data smoothing used on data derived from film is the *Butterworth digital filter*. The effectiveness of this method is highly dependent upon appropriate selection of a cut-off frequency. It has been suggested that cut-off frequency selection can be made by investigating the power spectrum of the data produced at various cut-off frequencies (Winter&Wells, 1978; Conte&de Boor, 1980). Winter&Wells (1978), used this harmonic analysis to determine a 6 Hz cut-off when 99% of the signal power was below the 7th harmonic. Even though this form of cut-off selection has been demonstrated to be effective, it requires at least a FFT program and generally a large amount of computer memory. The purpose of this note is to provide some simple alternatives or complementary methods to determine the cut-off frequency when using a Butterworth digital filter.

The simplest method in selecting the cut-off frequency can be to compare the highest derivative-time profiles of the unprocessed data and the smoothed data at various cut-off frequencies. Although this can be effective it is dependent on the visual display and is essentially subjective. In order to make the selection process more objective the following methods are proposed.

Conte and de Boor (1980) in their discussion on the selection of the degree of the polynomial to use when approximating data suggested that a comparison between the residuals would assist in the selection process. They contended that if the residuals (errors) behaved irregularly, then one could assume that the degree of the polynomial was sufficient. If the error behaved in a somewhat regular fashion not all of the information was contained in the approximating function. This selection concept has been tried on a number of occasions by the author. This analysis was found to complement the visual method yet was not discriminating enough.

Hamming (1973) gave another possible approach to the selection of the appropriate degree of polynomial to use in least-square polynomial approximations. He suggested that if only noise was left in the residuals, by simple probability, one would expect that a given residual would be followed by one of the same sign one half of the time and by one of an opposite sign half of the time. Using this description of following the trend in the data, the number of sign changes in the residuals are determined for the different cut-off frequencies investigated.

In summary, if one adheres to the principles of the Sampling Theorem, the above methods can provide alternatives, which maintain a degree of objectivity, in the selection of a cut-off frequency when using the Butterworth digital filter.

References:

- Conte, S.; de Boor, C. (1980). *Elementary Numerical Analysis: An Algorithmic Approach*. New York. McGraw-Hill.
- Hamming, R. (1973). *Numerical Methods for Scientists and Engineers*. (2nd ed.). New York. McGraw-Hill.
- Winter, D.; Wells, R. (1978). Proper sampling and filtering frequencies in kinematics of human gait.
In: *Proceedings of the 7th Canadian Medical and Biological Engineering Conference*. Vancouver. Canada.

(This is the report of the ISBS Nomination Committee and the presentation of the Executive Council slate)

The following positions of the Executive Council were identified by the council and therefore received nominations from the membership of the Society. The positions you will be voting on are as listed:

1. President Elect
2. Vice President for Publications
3. Vice President for Research and Projects.

Candidates who have allowed their names to stand for office are as follows:

1. PRESIDENT ELECT

ELLEN KREIGHBAUM, Department of Physical Education, Montana State University, Bozeman, Montana, USA.

Dr. Kreighbaum will host the Sixth International Symposium on Biomechanics in Sports at Bozeman in 1988 and by this illustrate the dedication and continued effort to ISBS. Executive position is not new for Dr. Kreighbaum as she has acted in the office of Secretary General in the past. Her attendance and membership have been most admirable over the years.

LEFTERIS TSAROUCAS, Director of Research in Biomechanics Hellenic Research Institute of Sports, Athens, Greece.

As president of the organizing committee of the Fifth International Symposium we have seen Dr. Tsarouchas' recent work efforts. In addition to this responsibility he has also been a member of the Board of Directors of ISBS as country representative and VP for Conferences and Meetings.

2. VICE PRESIDENT FOR PUBLICATIONS

PETROS POULMENTIS, Hellenic Research Institute of Sports, Athens, Greece.

Petros Poulmentis is a physiotherapist at the Hellenic Research Institute. He was member of the organizing committee for the Fifth ISBS Symposium. His membership has been most active during the past two years with efforts towards abstracts and proceedings.

BLAINE HOSHIZAKI, Biomechanics Laboratory, McGill University, Montreal, Quebec, Canada.

Dr. Hoshizaki's publishing and academic research presentations have been outstanding over the past years. Some of his major work was in the areas of original manuscript construction as well as symposium editor for sports such as Gymnastics and Ice Hockey.

3. VICE PRESIDENT FOR RESEARCH AND PROJECTS

RENE THERRIEN, University of Sherbrooke, Sherbrooke, Quebec, Canada.

Sport protection equipment has been a major area of concern for Dr. Therrien for many years. As a result of his work he was appointed the chair of the Protective Equipment Committee of

ISBS. his long-term efforts have provided us with superb research and bibliographic materials.

BRUCE MASON, Australian Institute of Sport, Biomechanics Laboratory, Canberra, Australia.

Dr. Mason has maintained an active and long standing membership in ISBS. He coordinates the biomechanical assessment of ten resident sports at the Australian Institute of Sport, with extensive backgrounds in cinematography and transducer analysis. The 1985 World Cup of Athletics was held in Canberra and the resulting films and videotapes of that competition are the efforts of Dr. Mason.

PETR SUSANKA, Charles University, Faculty of Physical Education and Sports, Chair of Anthropometrics, Biomechanics and Anatomy. Prague, Czechoslovakia.

Dr. Susanka as Head of the computing Department in Prague has concentrated on applied biomechanical research in Track and Field. His expertise has been developed in the areas of data collection, analysis and the presentation of this material. He has headed up the research teams for European and World Championships in Athletics.

PLEASE FORWARD THE ELECTION BALLOT TO THE SECRETARY GENERAL AT THE FOLLOWING ADDRESS:

Dr. Jackie Hudson
Department of Physical Education
University of North Carolina
Greensboro
North Carolina, 27412, USA.

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The Board of Directors has approved the following locations for the next ISBS Symposia: 1988 Bozeman, USA. 1989 Canberra, Australia. 1990 Prague, Czechoslovakia. 1991 Stuttgart, West Germany.

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+software sharing+++data sharing+

Persons who are interested in sharing software and/or data please contact: Dr. M. Adrian, Dept. of Phys. Ed., University of Illinois, Urbana, Il. 61801, USA.

+software sharing+++data sharing+

+COURSES AND CONFERENCES IN 1988+

7th SCHOOL ON BIOMECHANICS and SUMMER SCHOOL ON BIOMECHANICS

The 7th School on Biomechanics will be held June 6-8, 1988. The Topic is "Biomechanical Tests on Static and Dynamic Human Movement Potential". Lectures and paper on current research will be presented by Polish participants and foreign invited speakers. The Summer School on Biomechanics on June 9-10, 1988 will focus on theoretical and practical problems of muscle force and torque measurements and their application. The school is intended for Graduate students, teachers, coaches and physical therapists.

Dr. Bober (Wroclaw) and Dr. Dworak (Poznan) are chairing both courses. You may contact the organizing office under the following address: Dr. L. Dworak, Dept. of Biomechanics, Academy of Physical Education, Park Kasprzaka, 60-776 POZNAN, Poland.

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The National Institute of Physical Education, Madrid, Spain (INEF) organizes the 1988 AIESEP World Congress to be held July 26-31, 1988. Under the title "Humanism and New Technology in Physical Education and Sport" areas such as analysis and optimization of motor teaching through the application of new technology, motor development and sports Specialization and technology, physical performance, health and recreation will be covered. Abstracts must be submitted before May 30th. For further information please contact: Congreso Mundial AIESEP-1988, INEF, Ciudad Universitaria, 28040 MADRID, Spain.

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The International Conference on Exercise, Fitness and Health (ICEFH) will be held May 29 through June 3, 1988 In Toronto, Canada. The purpose of the conference is to bring together the world's leading exercise and medical scientists, to discuss and review research to develop statements defining the relationships between exercise, fitness and health and to apply these statements to current policies. For further information please contact: ICEFH, c/o Ontario Fitness Office, 1220 Sheppard Av. E., Toronto, Ont. M2K 2H1, Canada.

+++COMPUTER COMMUNICATIONS+++

The MIT-MULTICS Service is being discontinued as of Dec. 31. Mail sent to me at the address SMIT-MULTICS.ARPA:ULACSDSORUSO.BITNET has a forwarding address of ULACSDSORUSO.BITNET. Please use this new address to ensure smooth communication.

Hans J. Gros, Newsletter Editor

ISBS BOARD OF DIRECTORS MEETING

Announcements, actions and major items of discussion at the ISBS Board of Directors meeting in Athens, Greece during July 12-17, 1987. (Compiled by Jackie Hudson, Secretary General).

PRESENT: Abrantes, Adrian, Barabas, Bartlett, Bartonietz, Cryer, Dostal, Fabian, Floros, Formanek, Gowitzke, Gros, Hochmuth, Holt, Hudson, Kelley, Kilani, Kreighbaum, Morrison, Popov, Poulmentis, Rodano, Susanka, Terauds, Therrien, Thortensson, Tsarouchas, Waddell, Wolf.

ANNOUNCEMENTS:

1. Lefteris Tsarouchas gave a preliminary report of the Fifth Symposium: Delegates are expected from 21 countries; about 90-100 non-Greek delegates and 200-250 Greek delegates are expected. The scientific program has 83 free communications, 12 invited lectures, and 25 poster presentations. The social program is offered as a package and begins with a reception at Chandris Hotel.

2. Proceedings of the Fourth Symposium in Halifax, Nova Scotia were divided into two volumes: The papers on ice hockey and paddling comprised Volume 2; the remaining papers comprised Volume 1. The publisher has recently distributed Volume 1 and expects to distribute Volume 2 before the end of 1987.

ACTIONS:

1. The treasurer's report for 1986-87 was accepted.

2. Future conferences were awarded to Bozeman, Montana, USA for 1988; Australia for 1989; Prague, Czechoslovakia for 1990; and Stuttgart, West Germany for 1991.

3. Membership categories and fees are to be: individual, \$20; student, \$5; and group, \$40.

4. All ISBS members, regardless of category, are to be charged member registration fees when attending the ISBS symposia. The Symposium registration fee for non-members of ISBS should be set by the organizing committee.

5. A committee headed by P. Susanka of Czechoslovakia will distribute criteria, select winners, and fund prizes to Young Researcher's Award winners.

6. Symposium organizers will be responsible for selecting the Dyson lecturer and paying all related expenses except \$300 which will be paid by ISBS.

7. A position statement was passed by the Board: The ISBS supports scientific investigation without prejudice and with the most qualified scientists involved.

DISCUSSION:

1. Work continues on the constitution.

2. After viewing several submissions for the ISBS logo, it was decided to keep the contest open for another year.

...procedures for selecting the Geoffrey Dyson lecturer were submitted. (For details please check p. 2 of this Newsletter)

4. Procedures for increasing the involvement of ISBS in conducting research at the international level were discussed. Accordingly, each international sports federation will be sent a newsletter and a cover letter which identifies the ISBS and its objectives, gives some specifics of past and future research efforts, and offers help in conducting biomechanical research in their sport.

5. Projections about the 1988 ISBS symposium in Montana include exhibits by commercial, quasi-commercial and non-profit (including biomechanics graduate programs/laboratories) organizations and poster presentations by sport directors which give historical reviews of the biomechanical literature in the sports.

6. The hosts of future ISBS symposia should submit a statement of willingness to host the conference along with some specifics of the intended symposium to the vice-president of conferences and to the secretary general.

7. The publication of proceedings was discussed. Desirable characteristics include: inexpensive, timely, attractive, edited, reviewed by other publications, juried, underwritten, and continuous with one publisher.

ISBS ANNUAL GENERAL MEETING

Actions and announcements at the ISBS Annual General Meeting in Athens, Greece, July 16, 1987.

ACTIONS:

1. The minutes of the 1986 Annual General Meeting were approved.
2. The treasurer's report for 1986-87 was accepted.
3. The guidelines for selecting the Dyson lecturer were approved.
4. The actions taken by the Board of Directors since the 1986 Annual General Meeting were accepted.
5. As the ISBS has no current president-elect, the following motion was passed: The present officers holding the positions of president and past-president maintain their respective positions for one additional year. These people are Dr. Larry Holt (president) and Dr. Marlene Adrian (past-president). The period is extended to the 1988-89 year.
6. The slate of candidates submitted by the nominating committee (Marlene Adrian, Inseong Hwang, Bill Morrison (chair), Renato Rodano, Lela June Stoner, Czeslaw Wielki and Carole Zebas) was approved. (For more details see p.6 of this Newsletter)

ANNOUNCEMENTS

1. Hans Gros solicited contributions for the Newsletter.
2. Ellen Kreighbaum invited participants to the 1988 ISBS symposium in Bozeman, Montana.
3. Larry Holt solicited research proposals for the 1988 Olympic Games.



ANNOUNCEMENT AND CALL FOR PAPERS

SIXTH INTERNATIONAL SYMPOSIUM OF BIOMECHANICS IN SPORTS

5-11 JULY, 1988
MONTANA STATE UNIVERSITY, BOZEMAN, MONTANA, U.S.A.

INVITATION

The International Society of Biomechanics in Sports invites biomechanists, teachers and coaches to the Sixth International Symposium of Biomechanics in Sports to be held at Montana State University, Bozeman, Montana, U.S.A. Papers will be presented with the purpose of exchanging scientific information with colleagues on biomechanics applications to a variety of sports.

LOCATION

Bozeman, Montana is located in the heart of the Gallatin Valley in the northern Rocky Mountains. An extensive social program will be included in the schedule of events with additional excursions available in the post symposium schedule. Families are encouraged to attend. Housing in the dormitories and food service will be at minimal cost.

TOPICS

BIOMECHANICS OF SPORTS SKILLS

THROWING, KICKING AND STRIKING SKILLS

BODY ROTATION SKILLS - GYMNASTICS, DIVING, TRAMPOLINE, ETC.

SWIMMING SKILLS

JUMPING SKILLS

RESISTANCE SKILLS - WRESTLING, MARTIAL ARTS, LIFTING, ETC.

LOCOMOTOR SKILLS

CYCLING

SPEED SKATING

BIOMECHANICS OF SPORTS EQUIPMENT

CALL FOR PAPERS

Authors who wish to present papers or posters must submit abstracts of approximately 250 words in English before *March 1, 1988*. Selection of papers will be made by the scientific committee based on the quality of the research and its application to teaching and coaching. The accepted papers will be published in the proceedings. If you are interested in attending or presenting a paper contact the conference secretary at the address below.

Symposium Secretary
Department of Health and Human Development
Montana State University
BOZEMAN, Mt. 59717
U.S.A.
Telephone: (406) 994-6341



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JfS, Keplerstrasse 17
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D 7000 Stuttgart 1
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Dr. Kathy Barthels
Department of Physical Education
and Recreation Administration
California Polytechnic State University
San Luis Obispo, California 93407
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ISBS

International Society of Biomechanics in Sports