

American Society of Biomechanics Newsletter

Vol. 6

December, 1993

No. 2

From the President

Tom Brown

Iowa City has finally gotten back to normal after the record-setting 17th Annual Meeting on October 21-23. It was good that so many ASB members, and especially so many students, were able to attend: a total of 348 registrants. We all owe a big vote of thanks to Vijay Goel (Meeting Chair) and to Andy Biewener (Program Chair) for organizing such a memorable event. The quality of the podium presentations and the posters was rated as consistently high on the evaluation forms returned to the Education Committee. All three keynote presentations were stimulating and well attended, and Savio Woo gave a most enjoyable Borelli lecture. The German-style restaurants at the Amana Colonies managed to cope with an unexpectedly large crowd at the banquet, and even the weatherman cooperated with a beautiful midwestern fall week. Finally, thanks to unusually strong support from the exhibitors and from the meeting sponsors, our preliminary financial projections are that the meeting came in approximately on budget. Noteworthy in that regard was that we were able to keep the student registration fee (\$25) well below our actual costs (about \$120/student).

For those few of you who somehow missed the business meeting, here are some news items. Mark Grabiner's figures show that the Society is on extremely solid footing financially. (Over the coming months, the Executive board will be looking at investment options for that portion of the Society's assets which exceed our annual operating expenses plus contingencies.) Melissa Gross reported that the number of new membership applications to the Society is stronger than ever. It was especially encouraging to learn that our recruitment in the areas of Biological Sciences and Ergonomics (the two most under-represented of our five discipline categories) has markedly increased. The new President-Elect is Phil Martin, a veteran of service on both the Program and Awards Committees, and who was the Meeting Chair for the 1991 meeting in Tempe. The new Program Chair-Elect is Keith Williams, who very capably served as Newsletter Editor from 1987-1992. Education Chair duties have been turned over from Mary Rodgers (thanks for four good years, Mary!) to Jill McNitt-Gray,

who previously served on the Membership Committee. The new Student Representative is Tim Koh, from the University of Calgary, who has the challenging job of replacing Rosemary Speers. Alan Litsky and his committee are well into their preparations for the 1994 Annual Meeting at Ohio State, and the Executive Board has voted to accept a proposal submitted by Gary Beaupré and several of his colleagues in Palo Alto, to host the 1995 Annual Meeting at Stanford.

As you look ahead to preparing your submission(s) next spring for the 1994 Annual Meeting, two new matters bear attention. First, upon reviewing several options to ease the growing demand on their page budget, the editors of the *Journal of Biomechanics* have decided to discontinue the longstanding practice of publishing the short (1/3 page) abstract of papers presented at the meetings of ISB, ESB, and ASB. Therefore, submissions for our 1994 Annual Meeting will involve only the two-page extended abstracts that appear in the ASB Proceedings. Second, beginning with the 1994 Annual Meeting, the ASB is instituting a new Clinical Biomechanics Award, made possible by financial support from Butterworth-Heinemann, publishers of the journal *Clinical Biomechanics*. This will involve competitive review by the Awards Committee (with the Editor of *Clinical Biomechanics* serving as an ad hoc member) of papers submitted by ASB members. Pertinent details are continued on page 2

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From the President (continued)

available in the announcement on page 7 in this issue of the newsletter, and will be repeated prominently in the Call for Papers next spring.

As a related matter, ASB members now are eligible for a reduced-rate subscription to *Clinical Biomechanics*. This will be entirely optional, and will in no way affect our current arrangement with Pergamon Press and the *Journal of Biomechanics*. These reduced-rate subscriptions to *Clinical Biomechanics* are available through the Secretary-Treasurer; please see the announcement in Mark Grabiner's report.

Let me close by expressing my thanks for your confidence in choosing me to serve as President in the upcoming year. Fortunately, I have several excellent role models in that capacity among my predecessors, especially Ron Zernicke and Tom Andriacchi. Please feel free to contact me by telephone (319-335-7528) or via electronic mail (tom-brown@uiowa.edu) if you have any comments or suggestions.

From the Secretary/Treasurer

Mark Grabiner

The results of the election were as follows: The 1993-94 President-elect is Phil Martin from Arizona State University and the Program-chair elect is Keith Williams from the University of California-Davis. The total vote return was 32 percent of the membership which is lower than in recent years. Remember to exercise your right to vote! The Society is continuing to grow. There was a net growth of about 7.4 percent in 1993 and we are now 555 members strong. The relative distributions for the various membership categories and disciplines have remained essentially similar as have the relative proportions of male and female members. ASB will be patronizing 10 Symposia in Motor Control at the upcoming Second World Congress of Biomechanics to be held in Amsterdam. These symposia consist of about 45 presentations and include a large number of ASB members. Roger Enoka, who has organized these symposia with Daniel Kernell, is to be commended for his continuing efforts on behalf of the Society.

Please note that there has been a change in the arrangement that ASB has with Pergamon Press relative to the *Journal of Biomechanics*. In the past, Pergamon automatically mailed members the first three issues of the *Journal*. However, this policy has changed and now they will be sending only the first issue of the *Journal* unless they are notified by my office that membership has been renewed. So that delays or interruptions in your *Journal* subscription

may be precluded, be certain to submit your 1994 dues right away! One other item relative to Pergamon Press. I was told that there will most likely be an increase in the cost of the subscription to the *Journal of Biomechanics* in 1995. The increase, which is not expected to be greater than \$10, will be added to ASB membership dues. Best wishes for a successful 1994.

Software for Bone Researchers

To facilitate more accurate interpretation of whole bone torsion tests, we have developed a FORTRAN program (TWIST) to calculate areal and torsional properties of an arbitrary bone cross section. TWIST solves for the actual torsional properties of the bone section, eliminating the need for "equivalent" circular or elliptical approximations of the cross section (which can result in errors in excess of 40 % for maximum shear stresses). TWIST computes the centroidal location (X, Y), area (A), moments and product of inertia (Ix, Iy, Ixy, J), principal moments of inertia (I1, I2), torsion constant (K) and the distribution of shear stresses throughout the cross section.

TWIST accepts digitized descriptions of the outer (periosteal) and inner (endosteal) contours of a cross section, automatically generates a finite element mesh, and solves a finite element problem for the torsional properties. Alternatively, the user can provide a pre-defined mesh for more complicated geometries (e.g., a section with several holes). TWIST will run on most workstations, PC compatibles or Macintosh computers which have a FORTRAN compiler.

A copy of the source code and documentation can be obtained by sending an electronic mail message to:

levenston@roses.stanford.edu

Alternatively, a Macintosh formatted diskette should be sent to: Marc E. Levenston, Rehabilitation Research and Development Center (153), Palo Alto VA Medical Center, 3801 Miranda Avenue, Palo Alto, CA 94304-1200

ASB Newsletter on E-Mail

In addition to the hard copy version of this newsletter, we will also be distributing it across the Internet. This will be as a text file, just to the BIOMCH-L bulletin board and to ASB student members who have registered their e-mail addresses with Tim Koh. As promised in the last issue we have an Encapsulated PostScript (EPS) file that you will be able to retrieve using the "ftp" facility from our mainframe computer here in Charlottesville, and print out on your PostScript printer. If you would like to receive this newsletter and other information from the ASB make sure that you contact Melissa Gross (see her details on page 4) and apply for membership.

Buckeyes to Host ASB94

The 18th Annual Meeting of the American Society of Biomechanics will be held 13-15 October 1994 on the campus of the Ohio State University in Columbus, Ohio. The meeting will be co-hosted by OSU and the Cleveland Clinic Foundation.

Conference Location

The Ohio State University is located in Columbus, the capital of Ohio, and is readily accessible by air or car. The University will be open and in session at the time of the conference. The climate in mid-October is usually conducive for outdoor recreational activities; daytime highs of 60°-70°F, night-time lows of 40°-50°F University athletic/recreational facilities will be available to meeting participants on a limited basis. Other attractions in Columbus include an excellent zoo, the Center of Science and Industry (COSI), the Columbus Museum of Art, the Ohio Historical Center, and a wide variety of dining, shopping, and entertainment options.

Accommodations

A block of guest rooms has been reserved at the Holiday Inn on the Lane, site of the 1994 ASB meeting in Columbus. The room rate will be \$59.00 per room per night (1-4 occupants) plus 15.75% state and local taxes. The hotel provides shuttle service to and from Port Columbus International Airport. Complete hotel information will be provided with the conference registration materials in a subsequent mailing.

Registration Fees

The registration fee will be \$125 per person. With the help of local and corporate sponsorships, the Society expects to be able to offer a significantly reduced rate for students. Registration fee will include all program materials, the Conference Proceedings, lab tours, coffee breaks, the Thursday evening reception, the Borelli luncheon, and the dinner on Friday evening. There will be a small additional charge for the tutorials.

Conference Administration

The 18th Annual Meeting of the American Society of Biomechanics is being organized and coordinated by the Ohio State University Office of Continuing Education. Specific questions or requests regarding Corporate Exhibitions, Conference Location, Accommodations or Registration should be addressed to the ASB Conference Administrator: Office of Continuing Education - Conference Unit The Ohio State University, 225 Mount Hall, 1050 Carmack Road, Columbus, Ohio 43210-1002

Phone: (614) 292-8571

FAX: (614) 292-0492

Call for Papers

Abstracts are invited for consideration by the program committee for inclusion in the conference program. A two page extended abstract must be received by **April 15, 1994**. Complete instructions for the preparation of the abstract will be sent to each member of the Society. Questions regarding the Call for Papers or the Scientific Program should be directed to the Program Chair for the 1994 meeting: Robert J. Gregor. Questions regarding the local arrangements should be directed to Alan S. Litsky. Their details are provided on page 4 of this newsletter. Let's have a great turnout next year!

Sustaining Members

The sustaining membership category is aimed at encouraging affiliation by commercial organizations that market products which are used by the biomechanics research community, or companies that are otherwise engaged in activities that fall within the Society's general interest areas. Each member contributes \$500 per annum to the Society. We are happy to acknowledge and thank the following companies for their support as Sustaining Members:

Aircast

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Electro-Biology

Howmedica

Interpore Orthopaedics

Motion Analysis

MTS

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We invite all members of the Society to suggest names of potential sustaining members. Please send your suggestions to Melissa Gross (Membership Committee Chairperson) at the address indicated on page 4 of this newsletter. If you have a particular contact person at the company, please make sure to include his/her name.

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A View from the Academical Village

Kit Vaughan

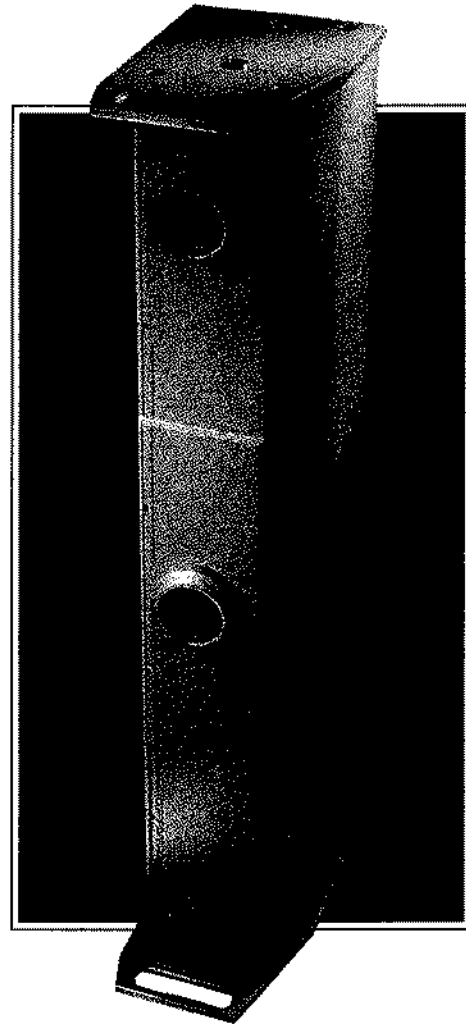
By the time many of you get this copy of the ASB Newsletter, 1993 will be over. I trust it was a good year for each of you and that 1994 will be productive from a biomechanics point of view. One of the benefits of my job as Editor (and you thought there were none, right?) is that I have an opportunity to say whatever is on my mind! The theme that I will explore in this issue is one that is near and dear to all of you: polishing your resumé (or curriculum vitae as it's also known).

As you will have read elsewhere in this newsletter, we had a great turnout in Iowa City for our annual meeting. Those of you who attended will echo Tom Brown's comments: the meeting was success, not least because you, the members, supported the scientific program with excellent podium presentations and posters describing your research. While these "papers" appeared as 2-page extended abstracts in the conference proceedings and will also appear as 1/3 page abstracts in the *Journal of Biomechanics* in 1994, your research has still not received the broad exposure that it deserves. Very few libraries will get conference proceedings and, as Tom Brown mentioned, the short abstracts will no longer be published in the *Journal of Biomechanics* (you really can't provide substantive details in 1/3 page any way). My biggest peeve is that some research is described at meetings and nowhere else! Here's my challenge to each of you: if you haven't already done so, write up your ASB 93 paper and submit it to a journal. We have four in our field which include the work "biomechanic*". These are the *Journal of Biomechanics*, *Clinical Biomechanics*, the *Journal of Applied Biomechanics*, and the *Journal of Biomechanical Engineering*.

Now, what about that CV? When studying a person's CV, whether this be for a job application or a research grant, I always look first to see the candidate's list of publications in peer-reviewed archival journals. These papers carry far more weight than conference proceedings, book chapters, or articles in journals and magazines that have little or no peer-review. In fact, it's a good idea to list your papers separately under these categories. While lumping them all together may seem like a convenient way to boost your numbers, this ruse is counter-productive and is quickly seen through in the review process.

All of us take our work in biomechanics seriously. If we want others to respect our work, we should not only present papers at national meetings but make a concerted effort to publish in the archival literature. I look forward to reading your research articles in 1994 and beyond!

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Students' Corner

Tim Koh

Greetings from the great white north! Ski season is almost upon us here in Calgary. Unfortunately, with the good you have to endure the bad - temperatures of -40°C (that's -40°F as well for those of you south of the border).

The Annual Meeting in Iowa City was a great success for students, and for the entire Society. Over 150 students attended the meeting. Students were treated to free tutorials, the student breakfast, the banquet in the Amanas, and the rest of the meeting, all for only \$25! If the meeting would have been just a little closer to Calgary, many of my fellow students would have attended. I would like to thank Vijay Goel, the Meeting Chairperson for the Iowa meeting, and the rest of the Executive Board, for their support of student involvement in the Society. The meeting next year in Columbus, OH, should be equally successful. Student registration has already been set at \$30. The low fee and the central location will likely again draw large numbers of students. See you there!

One of the many things discussed at the meeting was the role of the Student Representative in the society. The election procedure for the Student Rep was changed. Previously, the election was held at the same time as the elections for the positions of the Executive Committee. However, this did not give the voting students a chance to meet the candidates. Therefore, the elections will now be held at the Annual Meeting. The candidates will be given a chance to express their views to the students at the meeting. The election will then be held and results will be known before the end of the meeting. Another change is that the student representative is now a "non-voting participant" of the Executive Committee. The responsibilities of the Student Rep include attending the Annual and Mid-year Meetings. Financial assistance for getting the Student Rep to these meetings is available if necessary. Student Rep attendance at these meetings allows expression of student opinions and ideas directly to the Executive Committee. Becoming Student Rep provides an avenue for meeting the top people in biomechanics, and a way to help shape the future of our field. I strongly encourage anyone interested in running for Student Rep next year to contact me by e-mail (tjkoh@acs.ucalgary.ca).

What am I doing as Student Rep? I am continuing to compile an E-mail database for students in biomechanics (members and non-members). This will allow for more effective communication between the Student Rep and other students. If you are interested in being included on the list, send your name, institution, specific field of study, and e-mail address to me via e-mail. When this list becomes active (by December), I will begin discussion on some topics brought forward during the Iowa Meeting. These

include (1) a roommate network for the Annual Meeting, (2) a speaker for the student lunch at the Annual Meeting, and (3) a seminar for career opportunities in biomechanics (industry versus academics).

If you know any fellow students who are interested in biomechanics, and may be interested in ASB, ask them to contact me via e-mail. I will be glad to have information sent to them or help in anyway I can. In addition, if you need information about the Society or about biomechanics in general, don't hesitate to e-mail. The regular members of the Society represent a great resource for students, and it is part of my job to facilitate transfer of information.

Think about running for Student Representative next year. It's off to the slopes for me. Happy Holidays.

Clinical Biomechanics Award

At the recent ASB meeting at Iowa City, the Executive Board reviewed and approved a proposal for a CLINICAL BIOMECHANICS AWARD to be funded (\$250/yr) for an initial period of three years by Butterworth-Heinemann Publishers (BHP). The criteria for the award will be decided by ASB, and the Editor of the BHP journal *Clinical Biomechanics* will be an ad hoc member of the ASB Awards Committee for selecting the winner of this award each year. The award-winning presentation will be highlighted as the Clinical Biomechanics Award Paper during a session of the annual meeting. The winner of the award would be encouraged to submit the presentation in written form to be considered for publication in *Clinical Biomechanics*, but this is not a requirement. If the paper was subsequently published in *Clinical Biomechanics*, the paper would be listed under the heading of the ASB Clinical Biomechanics Award Winner. The award winner will also receive a complimentary subscription to *Clinical Biomechanics* for one year.

In addition, the proposal from BHP included an opportunity for any member of ASB to subscribe to the journal *Clinical Biomechanics* at a discounted rate, representing a discount of 80% off the full world rate. The 1994 volume of 6 issues would be US\$40. The option to subscribe to *Clinical Biomechanics* will appear on the dues notice that will be coming soon. Note that those members who wish to subscribe to *Clinical Biomechanics* will do so **in addition** to their subscription to the *Journal of Biomechanics*.

The Executive Board was pleased with the support that BHP has shown to the ASB and hopes that this arrangement will be a mutually beneficial relationship. The criteria and details for the competition for the 1994 ASB meeting will be coming in the announcements for the Ohio State meeting; look for the Clinical Biomechanics Award information in the same section describing the specifics of the Borelli and Young Investigator Awards.

Calendar of Events

20-22 February 1994

4th Annual Conference of the Australian Society for Biomaterials, Coogee Beach, Sydney, Australia, Arthur Brandwood; Australian Society for Biomaterials Inc.; Centre for Biomedical Engineering; UNSW, PO Box 1, Kensington; NSW 2033, Australia Tel. +61 (0)2 697 3911; FAX. +61 (0)2 663 2108; A.Brandwood@unsw.edu.AU

21-24 February 1994

40th Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana. Orthopaedic Research Society; 6300 N. River Road, Suite 727; Rosemont, IL 60018-4226.

11-15 April 1994

High Performance Computing '94: Grand Challenges in Computer Simulation, La Jolla, California Soc. for Computer Simulation; P.O.Box 17900; San Diego, CA 92177; Tel. (619)277-3888 FAX. (619)277-3930 scs@sdsc.edu

16-17 April 1994

Thirteenth Southern Biomedical Engineering Conference, Engineering Research Institute; University of the District of Columbia; Washington, D.C., Dr. Jafar Vossoughi, Tel. (202) 282-2388, FAX. (202) 282-2389

24-28 April 1994

First World Congress on Computational Medicine and Public Health, Austin, Texas; Compmed 1994; University of Texas System CHPC; Balcones Research Center, 1.154CMS; 10100 Burnet Road, Austin, Texas 78758-4497, Tel. (312) 471-2472 FAX (512) 471-2445; e-mail: compmed94@chps.utex.as.edu.

22-23 June 1994

STSF '94: An International Workshop on Science and Technology through Science Fiction, Barcelona, Spain; Miquel Barcel; Facultat d'Informtica; Universitat Politcnica de Catalunya; Pau Gargallo, 5; E 08028 BARCELONA (Spain) Tel. 34.3.401.6958 FAX. 34.3.401.7113 blo@lsi.upc.es

24-25 June 1994

IEEE Workshop on Biomedical Image Analysis; Seattle, Washington. Thomas Huang; Department of Electrical and Computer Engineering; University of Illinois; Urbana, Illinois 61801 huang@uicsl.csl.uiuc.edu

30 June - 2 July 1994

IVth EMED User Group Meeting; Dept. Unfallchirurgische Forschung und Biomechanik, Universitet Ulm, Germany D. Rosenbaum, H.P. Becker; Abteilung Unfallchirurgische Forschung und Biomechanik; Universitet Ulm; Helmholtzstr. 14; D-89072 ULM Germany Tel. (country code) 731-502 3492 or 3481 FAX. () 731-502 3498 diro@sirius.medizin.uni-ulm.de

2-6 July 1994

ISBS '94: XII International Symposium of Biomechanics in Sports, Budapest-Siofok, Hungary ISBS '94 Symposium Secre-

tariat; Department of Biomechanics; Hungarian University of Physical Education; H-1123 BUDAPEST; Alkotás u.44.; HUNGARY

5 - 8 July 1994

International Conference on Clinical Gait Analysis, Dundee, SCOTLAND. Mrs Jean Whyte; Dundee Limb Fitting Centre; 133 Queen Street; Broughty Ferry; Dundee DD5 1AG; Scotland. Tel. + 44 (0)382 730104 FAX. + 44 (0)382 480194

5-8 July 1994

Third International Symposium on 3-D Analysis of Human Movement, Stockholm, SWEDEN; Dr. Paul Allard, Ph.D., P.Eng.; Permanent Secretariat; International Symposium on 3-D Analysis of Human Movement; Centre de Recherche; Sainte-Justine Hospital; 3175 Cote Ste-Catherine; Montreal, PQ, H3T 1C5, CANADA Tel. +1-514-345-4740 FAX. +1-514-345-4801 allardp@ere.umontreal.ca

10-15 July 1994

Second World Congress of Biomechanics Amsterdam, The Netherlands; Biomechanics Section; Institute of Orthopaedics; University of Nijmegen; P.O. Box 9101; 6500 HB NIJMEGEN, The Netherlands Tel. +31-80-613366 FAX. +31-80-540555

18-20 August 1994

Canadian Society for Biomechanics VIIIth Biennial Conference; The University of Calgary, Calgary, Alberta, CANADA. Margaret-Anne Stroh; Conference and Special Event Services; The University of Calgary - Olympic Volunteer Center; 1833 Crowchild Trail, NW; Calgary, Alberta T2M 4S7; CANADA Tel. (403) 220 6229 FAX. (403) 284 4184 Abstracts must be received by March 15, 1994

21-26 August 1994

World Congress on Medical Physics and Biomedical Engineering, Rio de Janeiro, Brazil, General Secretariat; Congrex do Brasil s/a; Rua do Ouvidor, 60/414; 20040-030 Rio de Janeiro, RJ Brazil Tel. +55-21-224-6080 FAX. +55-21-231-1492

26-27 August 1994

The Lumbar Spine- A Basic Science Approach; First International Symposium, Brussels, Belgium. International Society for the Study of the Lumbar Spine; c/o Sunnybrook Medical Centre, Room A 309; 2075 Bayview Avenue; CDN-Toronto, Ontario, Canada; M4N 3M5 Tel. (416) 480-4833 FAX. (416) 480-6055 Abstracts should be received by the ISSLS office by 1 Feb 1994.

4 - 7 October 1994

Visualization in Biomedical Computing 1994 (VBC '94) Rochester, Minnesota, Richard A. Robb, Ph.D.; Mayo Foundation/Clinic; Medical Sciences Building 2-135; 200 First St., SW; Rochester, MN 55905 Abstracts due February 1, 1994

13-15 October 1994

18th Annual Meeting of the American Society of Biomechanics; Columbus, OH. ASB Conference Administrator; Office of Continuing Education - Conference Unit; The Ohio State University; 225 Mount Hall; 1050 Carmack Road; Columbus, OH 43210-1002 Tel. (614)292-8571 FAX. (614)292-0492.

27-30 October 1994

SIROT 94 Societe Internationale de Recherche en Orthopeie - 3rd International-Meeting Boston, MA, USA. Henry J. Mankin, M.D.; Department of Orthopaedics; Massachusetts General Hospital; Boston, MA, USA 02114 Tel. (617)726-2943.

2-6 July 1995

XVth Congress of the International Society of Biomechanics; Jyvaskyla, Finland. XVth ISB Congress; Jyvaskyla Congresses; P.O. Box 35; FIN -40351 Jyvaskyla; FINLAND Tel. +358 41 603 664 FAX. +358 41 603 621 tvanttin@jyu.fi

Job Opportunities in Biomechanics

NIH Post-Doctoral Fellow Position includes the development of biomechanical models of speech and swallowing dynamics based on multimodality image and sensor data. Dr. B. Sonies, Tel: (301) 496-4733 ext.30 Fax: (301) 402-0663

Research Faculty and Postdoctoral Fellows with expertise in neurophysiology and/or biomechanics to carry out research on vestibulospinal control of head position and posture. Barry W. Peterson, Director; Center for Vestibular Research; Northwestern University Medical School, M211; Chicago, IL 60611 email: barry_peterson@plato.nwu.edu

Biomechanical Engineer for kinematic / kinetic measurements in gait analysis at The University of Kuwait / Faculty of Allied Health Sciences & Nursing Physical Therapy Contact Mrs. P. Chanmugam in Kuwait Fax: (965) 4-830-937, 4-833-682

Exercise Physiologist or Psychologist for faculty position in the physical therapy program. Duties involve teaching and research. Option for pursuing a physical therapy degree available. Marquette University, Search Committee; Walter Schroeder Complex, Room 346; Milwaukee, WI 53233 Tel: (414) 288-7161 Fax: (414) 288-5987 e-mail: simoneaug@vmsf.csd.mu.edu

Post-doctoral Fellowships for research in biomechanics. Professor Bruce Abernethy; Head, Department of Human Movement Studies; The University of Queensland; Queensland 4072 AUSTRALIA

Research Position Candidates must hold an M.D. degree and completed Orthopaedic Residency Program. Preference will be given to those individuals with demonstrated interest in lower extremity, particularly ankle joint ligament injuries and rehabilitation. Mark D. Grabiner, Ph.D.;

Dept. of Biomedical Engineering, Wb3; The Cleveland Clinic Foundation; 9500 Euclid Avenue; Cleveland, Ohio, 44106

Staff Positions (full professor equivalent) in Cardiac Assist & Replacement and Heart Valve Mechanics to develop new research, secure extramural funding to support these activities, and participate in graduate education. Potential for faculty appointment at The Ohio State University.

J. F. Cornhill, Chairman; Dept. of Biomedical Engineering (Wb3); The Cleveland Clinic Foundation; 9500 Euclid Avenue, Cleveland, Ohio 44195 Tel: (216) 445-6980 Fax: (216) 444-9198

Postdoctoral Position in Biomechanics available January 1, 1994. Research will involve modeling of the human musculoskeletal system. Mark D. Grabiner, Ph.D.; Dept. of Biomedical Engineering, Wb3; The Cleveland Clinic Foundation; 9500 Euclid Avenue; Cleveland, Ohio, 44106

Assistant/Associate Professor to establish and supervise bioengineering laboratory. Demonstrated experience in orthopaedic biomechanics with emphasis on trauma and implants. Assistant Professor with demonstrated ability to conduct research in tissue engineering. David S. Bradford, M.D.; Professor and Chairman; Dept of Orthopaedic Surgery, U-471, Box 0728; University of California, San Francisco; San Francisco, CA 94143-0728

Director of Orthopaedic Research Ph.D. and/or M.D. Teaching and research responsibilities pertaining to musculoskeletal diseases. Vincent D. Pellegrini, Jr., M.D.; Chairman, Dept of Orthopaedics; The Milton S. Hershey Medical Center; P.O. Box 850 - Drawer JOR; Hershey, PA 17033

Predoctoral and Postdoctoral Positions available for research in cartilage, bone and musculoskeletal disorders. Roland W. Moskowitz, M.D., Director; Musculoskeletal Training Grant; Case Western Reserve University, University Hospitals of Cleveland; 2074 Abington Rd.; Cleveland, OH 44106

Director of Musculoskeletal Research Expertise in the field of cell and molecular biology of musculoskeletal tissues. Dan M. Spengler, M.D., Professor and Chairman; Dept. of Orthopaedics & Rehabilitation; Vanderbilt University Medical Center; D-4219 MCN; Nashville, TN 37232-2550

Assistant / Associate Professor Experimental and analytical research of musculoskeletal system and fracture healing. Fred F. Behrens, M.D., Chairman; Dept. of Orthopaedics; UMDNJ - New Jersey Medical School, MSB G-574; 185 Orange Ave.; Newark, NJ 07103

Faculty Positions Emphasis in the area of biomechanical systems. Research and teaching record commensurate with position sought. Prof. Selcuk I. Guceri, Head; Dept of Mechanical Engineering (M/C 251); University of Illinois at Chicago; Room 2037 ERF; 842 West Taylor Street; Chicago, IL 60607-7022

Assistant Professor Positions (Ph.D.) Experimental research in biomechanics of soft tissue. Demonstrated potential for teaching and research. J. E. Dunn, Chair, Search Committee; Dept of Engineering Mechanics; University of Nebraska-Lincoln; Lincoln, NE 68588-0347.

Endowed Professorship in Orthopaedic Surgery Research. T. David Sisk, M.D., Professor and Chairman; University of Tennessee - Campbell Clinic; Dept. of Orthopaedic Surgery; University of Tennessee, Memphis; 800 Madison Avenue; Memphis, TN 38163

Biomedical/Rehabilitation Engineer for research and development of lower limb prostheses. Dr. James Morrison; School of Kinesiology; Simon Fraser University, Burnaby, B.C. V5A 1S6. CANADA Tel: (604)291-3756 Fax: (604) 291-3040 email: james_morrison@sfu.ca

Full Professor in ergonomic design Product-development, teaching and research responsibilities. Chairman of the Vacancy Committee, Prof. Dr. J.M. Dirken, Faculty of Industrial Design Engineering, Jaffalaan 9, 2628 BX Delft, The Netherlands. Tel: 31-(0)15 783081 Fax: 31- (0)15 787179 email:j.f.m.molenbroek@io.tudelft.nl

Assistant Professor in human motor control with background in human motor learning and movement disorders. Jane E. Clark; Department of Kinesiology; University of Maryland; College Park, MD 20742-2611 Tel:(301)405-2474 Fax:(301) 314-9167 email: JC60@UMAIL.UMD.EDU

Postdoctoral Position Study of cardiac mechanics using finite element methods and image analysis to model cardiac mechanics and study structure/function relations. Leon Axel, PhD, MD; Dept. Radiology, Hospital of the University of Pennsylvania; 3400 Spruce St.; Philadelphia, PA 19104 Tel: (215) 662-6225 Fax: (215) 349- 5115 email: axel@spamm2.spamm.upenn.edu

Head, Department of Bioengineering. Candidates must have credentials appropriate for appointment to full professor. Dr. Dennis L. Powers, Chairman; Department Head Search Committee; Clemson University; Dept of Bioengineering; 301 Rhodes Engineering Research Center; Clemson, SC 29634-0905

Bio/Mechanical Engineer Technician Coordinator for Orthopaedic Bioengineering Research Laboratory. Duties include management of lab activities, design and implementation of experiments, and data analysis. Michael J. Voor, Ph.D.; Dept of Orthopaedic Surgery, University of Louisville; Louisville, KY 40292

Bio-Fluid Mechanics Engineers to perform mathematical modeling of flow through medical devices or to determine the relationship between in vitro device performance and clinical complications. Ronald F. Carey; FDA/CDRH; 12721 Twinbrook Pkwy; Rockville, MD 20857 Tel: (301) 443-6113

Faculty Position in Biomedical Engineering. Research interests in biomechanics of implant design, tissue-implant interface, bone modeling/remodeling and related cellular mechanics preferred. Rob Roy, DEngSc, MD, Head; Dept of Biomedical Engineering; 7049 Jonsson Engineering Center; Rensselaer Polytechnic Institute; Troy, NY 12180-3590 Tel: (518) 276-6959 Fax: (518) 276-3035.

Faculty Position in Biomedical Engineering. Preference given to candidates with research interests in macromolecular architecture, surface/membrane engineering, tissue engineering, medical imaging, and biomechanics. W.M. Reichert; Chair, Search Committee; Box 90281; Department Of Biomedical Engineering; Duke University; Durham, NC, 27708-0281

Senior Faculty Position in Cognitive and Neural Systems. Analytic and computational research in modeling nonlinear neural networks, especially vision & image processing, visual cognition, spatial orientation, and cognitive information processing. Search Committee; Department of Cognitive and Neural Systems, Room 240; 111 Cummington Street; Boston University; Boston, MA 02215

Pre-/Post-doctoral Research Position. One year contract for in vitro biomechanical evaluation of orthopaedic nailing systems. Prof. Armando Giunti; Laboratorio di Tecnologia dei Materiali; Bologna, Italy Tel:0039-51-6366864 Fax:0039-51-6366863 email: ita0940@AppleLink.Apple.com

Applicants are strongly encouraged to contact the listing individual/organization directly to determine current status and to obtain additional information.

New MTS Products Expand Biomaterial Testing Capabilities

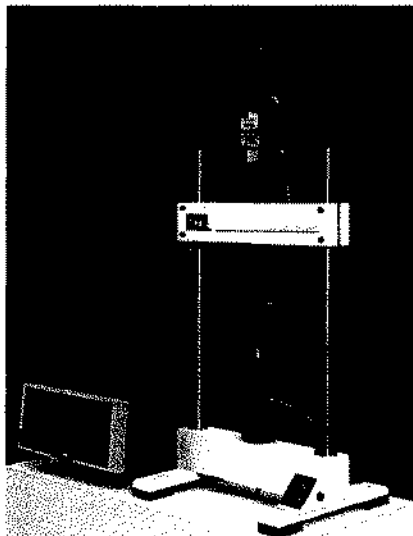
Mini-Bionix® System Offers Broad Testing Capabilities In Small, Economical Package

The MTS Mini-Bionix® system is a new, competitively priced material testing system specifically engineered for low-force characterization of biomaterials and biomechanical constructs. It's small enough to conveniently fit on a standard lab table, yet provides the versatility to perform a wide variety of biomedical tests, including:

- Characterizing the mechanical and fatigue properties of electrical leads used in implantable devices.
- Characterizing collagen tissues.
- Simulating fatigue loading on materials for orthopedics.
- Simulating uniaxial loading of knee or hip joints.
- Prosthetics characterization.

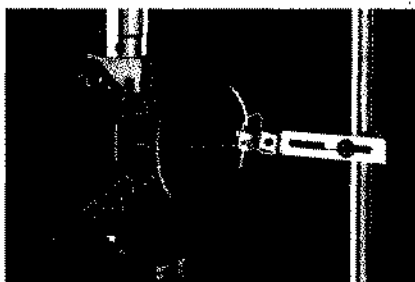
The system is set up to accurately measure and control static and dynamic loads ranging from grams up to 10 kN (2200 lbs). Torsional loading capability may be added, as an option.

For more demanding applications,



MTS also offers larger, floor-mounted Bionix systems with additional capabilities in controls, fixturing, software, and multiaxial simulation.

Biomedical Extensometer Measures Soft Tissues With Minimal Contact Force Effects



If you've been looking for an effective way to measure strain in soft tissue samples, MTS has the answer. Our new Model 632.32 biomedical extensometer requires as little as one gram of contact force per extensometer arm. Developed in conjunction with the University of Calgary in Canada, it features a unique "flexure loop" design that keeps the two arms in perpendicular alignment with the specimen, even under the large free-body motions that can occur when testing long, compli-

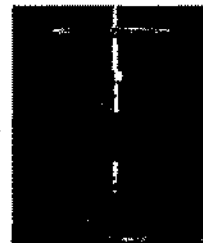
ant samples. This assures that the contact forces of the two sensor arms remain equal and that accurate strain measurements are recorded even on very soft tissues. In addition, multi-point contacts on the arms assure uniform, repeatable mounting to the specimen while preventing specimen damage.

Low-Force Grip Submersible In Body Fluids

Pictured to the left with our biomedical extensometer is an MTS mechanical cam-action grip designed specifically for biomechanics work. It's medical-grade titanium construction makes it light in weight and submersible in saline solutions and blood serum. That makes it particularly popular for environmental testing and where low grip mass is critical to assessing dynamic performance.

New Bath Mimics In Vitro Environment

MTS can provide environmental chambers to simulate a variety of conditions. One of our newest is the environmental bath, to the right, which is equipped to spray a saline solution for a 100% humidity condition. When outfitted with a circulation heat exchange coil, it can also bathe specimens in an appropriate blood serum or synovial fluid. Both spray and bath are equipped with a semi-closed-loop control system for maintaining a constant temperature of 37°C.



Simulator Speeds Up Hip Joint Tests

This multi-station hip joint testing system provides a realistic and practical compromise between using general-wear screening devices (such as pin-on-disk) to test hip joint replacements and the intensive research accomplished through full-scale simulation and modeling using a Bionix multi-channel testing system.

A biaxial rocking motion of 23 degrees is synchronized with the flexion and extension movements of the leg to simulate the motions and loads seen during walking. Component design optimization and material properties evaluation are the intended results.



New Brochure Highlights Bionix Systems

A new Bionix brochure describes all of our biomaterials testing systems and accessories. Let us send you a copy.

Education Chair's Report

Jill McNitt-Gray

I would like to thank Mary Rodgers, the Past Chair of the Education Committee, for her outstanding contributions to ASB. Through her leadership, the education committee has been successful in improving the communication and scientific exchange of ideas between society members, students, and conference organizers. In this report, I would like to (1) summarize evaluations and comments regarding the 1993 ASB Meeting, (2) request your assistance in creating a biomechanics graduate program data base; and (3) request tutorial proposals for the 1994 ASB Meeting.

Responses from ASB Members regarding the 1993 ASB Meeting at the University of Iowa

Thank you to the 35 conference attendees who returned the yellow evaluation forms in your registration packet. Your comments are appreciated! The 1994 Program and Meeting Chairs, have requested copies of the original forms and a compilation of comments, so that they may incorporate your suggestions for the 1994 ASB Meeting at Ohio State University. The following comments have been summarized from 35 evaluation forms received as of 11/15/93. If you would like your comments to be included, please send me your evaluation form.

The majority of the comments regarding both the laboratory tours content and the tutorials on Finite Element Methods in Biomechanics, by Richard Hart and Thomas Brown, and Segment and Joint Orientations in 3D Space, by James Andrews were outstanding. Congratulations to our hosts and presenters! Comments regarding keynote and award winning presentations were also excellent. Some constructive suggestions were provided to improve the layout for poster presentations, minimize

audio-visual difficulties, and scheduling of keynote presentations. As one might expect, the greatest variation in scores was for food. Overall, the conference location, facilities, and staff received high marks. Congratulations to Vijay Goel and his staff for a successful and enjoyable meeting.

Creation of a Biomechanics Program Data Base

The membership has a strong interest in the creation of a biomechanics program data base to assist graduate students locate academic programs or post doctorate opportunities. The information requested is based on recommendations made during the Student Breakfast at the 1993 ASB Meeting.

If you would like your program to be included in the data base please send me the following information regarding your program: Name, address, phone, FAX, email, research emphasis, degrees offered, advisor/student ratio, associations with other departments or medical institutions, and availability of research or teaching assistantships.

Tutorial Proposals for 1994 ASB Meeting Requested by January 15, 1994

If you are interested in giving a tutorial at the 1994 ASB meeting at Ohio State, please submit a tutorial proposal by January 15, 1994. Please include: the title, your name, your degrees, affiliations, mailing address, telephone & FAX numbers, email address, a course description of 150 words or less, and audio-visual needs. Proposals will be reviewed by the ASB Executive Board at the midyear meeting. Thank you for your interest.

Please send all correspondence to:
Jill McNitt-Gray
Department of Exercise Science- PED 107
University of Southern California
Los Angeles, CA 90089-0652
213-740-2492
FAX 213-740-7909

ASB Tutorial Proposal

Title: _____

Name _____ Degrees: _____

Affiliation/Organization: _____

Address/City/State/Zip: _____

Telephone: _____ Fax: _____ e-mail address: _____

Other Presenters: _____

Name _____

Affiliation/Organization: _____

A Course Description (150 words or less) and your audiovisual needs should be submitted on a separate sheet of paper by **15 January 1994**.

