4th ANNUAL MEETING OF THE INTERNATIONAL SOCIETY FOR COMPUTER ASSISTED ORTHOPAEDIC SURGERY

CAOS INTERNATIONAL 2004 CHICAGO

JUNE 16 - 19, 2004

Chicago, Illinois, USA

Conference Organizer

S. David Stulberg, M.D.
Professor, Clinical Orthopaedic Surgery
Northwestern University, Feinberg School of Medicine, USA

Jointly Sponsored by

Northwestern University, Feinberg School of Medicine,
Department of Orthopaedic Surgery
and Northwestern Arthritis and Rehabilitation Institute

CAOS - INTERNATIONAL 2004

PROGRAM AT A GLANCE

TIME	JUNE 16th WEDNESDAY	JUNE 17th THURSDAY	JUNE 18th FRIDAY	JUNE 19th SATURDAY
6:45 am		Coffee Break in the Industrial Exhibition	Coffee Break in the Industrial Exhibition	Coffee Break in the Industrial Exhibition
7:00 am				
7:15 am		Introduction	Introduction	Introduction
7:30 am		Video Session 1 7:30am - 8:00am	Video Session 2 7:30am - 8:00am	Video Session 3 7:30am - 8:00am
8:00 am		Total Knee Replacement - Part 1: Clinical Results 8:00am - 9:30am	Total Hip Replacement 8:00am - 9:30am	Total Knee Replacement - Part 3: Comparative Studies 8:00am - 9:30am
8:30 am				
9:00 am				
9:30 am		Coffee Break in the Industrial Exhibition	Coffee Break in the Industrial Exhibition	Coffee Break in the Industrial Exhibition
10:00 am		Keynote Lecture 1 10:00am - 10:30am	Keynote Lecture 2 10:00am - 10:30am	Spinal Surgery 10:00am - 10:50am
10:30 am		Accuracy of Registration & Navigation 10:30am - 12:00pm	Novel Instrumentations 10:30am - 11:45am	Trauma Applications 10:50am - 11:30am
11:00 am				
11:30 am			Lunch Break 11:45am - 12:45pm	New Approaches to Components of CAOS 11:30am - 12:45pm
12:00 pm		Lunch Break (incl. General Assembly) 12:00 noon - 1:30pm		
12:30 pm			Poster Exhibition - Part 2 12:45pm - 2:00pm	Best Paper & Poster Awards 12:45pm - 1:00pm
1:00 pm				Closing Remarks 1:00pm
1:30 pm		Poster Exhibition - Part 1 1:30pm - 2:30pm		
2:00 pm			Total Knee Replacement - Part 2: Accuracy Aspects 2:00pm - 3:30pm	
2:30 pm		Emerging Technologies 2:30pm - 3:20pm		
3:00 pm		Osteotomies 3:20pm - 4:00pm		
3:30 pm			Industrial Workshop Session 2 3:45pm - 5:25pm	
4:00 pm	REGISTRATION & COCKTAIL RECEPTION 4:00pm - 6:30pm	Industrial Workshop Session 1 4:15pm - 6:15pm	Workshop V, Workshop VI, Workshop VII	
4:30 pm		Workshop I, Workshop II, Workshop III, Workshop IV		
5:00 pm				
5:30 pm				
6:00 pm				
6:30 pm			BUSES LEAVE WESTIN 6:45pm M.E. Müller Awards Banquet 7:00pm - 11pm	
7:00 pm				

- THE PROGRAM SCHEDULING AND FORMAT IS SUBJECT TO CHANGE AT THE DISCRETION OF THE PROGRAM PLANNING COMMITTEE -

CAOS INTERNATIONAL 2004

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GENERAL INFORMATION

Conference Location

Westin Chicago River North
320 North Dearborn
Chicago, Illinois USA
Phone: +1-312-744-1900
Fax: +1-312-527-2650

Registration and Information Desk

The Registration and Information desk will be open during the following times:

Wednesday, June 16th . . . . .4:00 p.m. – 6:30 p.m.
Thursday, June 17th . . . . . .6:45 a.m. – 6:30 p.m.
Friday, June 18th . . . . . .6:45 a.m. – 5:30 p.m.
Saturday, June 19th . . . . . .6:45 a.m. – 1:00 p.m.

Evaluation

There is a conference evaluation form in your packet. Your feedback is very important to the improvement and development of this Conference. Please return completed form to the Conference Registration Desk.

Participant List

In your conference material is a participant list, which includes all pre-registered attendees as of midnight June 10th. There will be an addendum to this participant list for all registrations received after June 10th. Please be sure to pick one up at the registration desk before you leave the Conference.

Job Market Board

Please visit the Job Market Board located near the Conference Registration Desk to see current job opportunities or to place your resume on the board.

Cellular Phones, Pagers and Watch Alarms

Out of courtesy to our speakers and other attendees, please turn off any cellular phones, pagers and watch alarms during sessions.

Cameras and Tape Recorders

Cameras and tape recorders are strictly prohibited in the sessions, poster presentations, workshops, and the exhibit area.

Name Badges

All attendees and guests must wear their name badge at all times to gain admission to all conference sessions, exhibit area, workshops, Welcome Reception, and the banquet on Friday night.

Meeting Room Logistics

Please contact the Conference Registration Desk if you find the temperature in the room uncomfortable or you are unable to hear or see because of equipment difficulties.

Smoking

All meeting rooms and seated functions are smoke free. Please regard the smoking policy of the Westin Chicago River North and use designated smoking areas only.

Information/Message Board

The Information/Message Board will be located near the Conference Registration Desk. Messages will be posted in this area throughout the Conference.

Conference Proceeding

An extended abstract of each paper presented at the Conference has been published in the Proceedings. One copy is included in your bag. Additional copies may be purchased at the Conference Registration Desk. Purchase price of the Proceeding will increase after the Conference. Be sure to order your additional copies in advance.

The Society would like to thank Dr. Stulberg and his staff at the Northwestern Arthritis & Rehabilitation Institute for their hard work in preparation and printing of the Conference Proceedings.

Additional Conference Proceedings

Your registration fee includes (1) Proceeding.
Additional Proceeding . . . . . $60.00 (each)
(Price does not include shipping)

Official Language

The official language of the Conference is English and will be used for all presentations and printed materials.

Currency Exchange

Only US dollars are acceptable at regular stores and restaurants.
The exchange rate fluctuates daily. Visit http://www.onada.com

Traveller's Checks and Credit Cards

Credit cards, including MasterCard®, Diners Club®, Visa® and American Express®, and traveller's checks are accepted at most hotels, restaurants, department stores, and souvenir shops.

Electricity

Electricity throughout the United States is 110V, 60 Hz.

Shipping Service

If you need to ship or mail any packages, please visit the Business Center located on the Mezzanine Level. Shipping is to be made at attendees own expense. Business Center hours are Monday through Friday, 8:00 a.m. to 5:30 p.m.

Photo by Cheryl Tadin

Internet Connection

All sleeping rooms in the Westin Chicago River North have high speed internet connection (ethernet).
For those who do not have a laptop, please visit the Business Center.

Airline Phone Numbers

Here are a few of the airlines that serve Chicago O'Hare International and Midway Airports:

Continental Airlines . . . . . 1-800-525-0280 . . . . . www.continental.com
Delta Air Lines . . . . . 1-800-221-1212 . . . . . www.delta.com
Northwest Airline . . . . . 1-800-225-2525 . . . . . www.nwa.com
Southwest Airlines . . . . . 1-800-435-9792 . . . . . www.southwest.com
United Airlines . . . . . 1-800-241-6522 . . . . . www.ual.com
US Airways. . . . . 1-800-428-4322 . . . . . www.usairways.com

Car Rental

The Conference has selected ***AVIS*** Rent a Car as the official car rental company. If you should need to rent a car during your stay in Chicago, you can contact Avis at the following number:
1-800-331-1600. Refer to AWD#: J818225

SOCIAL EVENTS

Welcome Reception

Wednesday Evening, June 16th, 4:00 p.m.-6:30 p.m.

In conjunction with registration, an informal Welcome Reception will be held in the Astor Ballroom, River Level I of the Westin Chicago River North.

M.E. Müller Awards Conference Banquet

Friday Evening, June 18th, 7:00 p.m. – 11:00 p.m.

The Conference Banquet is scheduled for Friday evening at the world famous John G. Shedd Aquarium. The Shedd Aquarium offers the world's largest array of more than 8,000 aquatic mammals, reptiles, amphibians, invertebrates and fish. The Shedd's magnificent Oceanarium is the world's largest marine mammal pavilion and is home to Beluga whales, dolphins, Alaskan sea otters, seals and penguins.

Shuttle buses will depart from the main entrance of the Westin Chicago River North at 6:45 p.m.
The last shuttle will leave the Aquarium at 11:00 p.m.

This event is included in the registration fee.
Additional tickets may be purchased for guests at the registration desk.
Guest Banquet Ticket. $60.00

Copyright© Shedd Aquarium, photo by Edward G. Lines, Jr.

EDUCATIONAL SUPPORT

We would like to acknowledge the following institutions and companies for the Unrestricted Educational Grant support for this conference:

Banquet Benefactor

BrainLAB orthopedic solutions

Proceedings Benefactor

DePuy a Johnson & Johnson company

Executive Dinner Benefactor

AESCULAP

Workshops

AESCULAP
BrainLAB orthopedic solutions
DePuy a Johnson & Johnson company
ORTHOsoft
pi SYSTEMS
stryker
zimmer Confidence in your hands

Totebag & Lanyard Benefactor

AESCULAP

Final Program Benefactor

NDI

EDUCATIONAL SUPPORT

Exhibitor Level

EXHIBITORS

Exhibits are located in the Grand Court and Promenade Ballroom, River Level II.
Please see the floorplan on page 8.

Aesculap 7
3773 Corporate Parkway, Center Valley, PA 18034, USA
Phone: 1-800-282-9000 • Fax: 1-610-791-6880
Website: www.aesculap.com

Biomet 12
Airport Industrial Park, Warsaw, IN 46580, USA
Phone: 1-800-348-9500 • Fax: 1-574-372-1904
Website: www.biomet.com

BrainLAB 10
Ammerthalstrasse 8, Heimstetten 85551, GERMANY
Phone: +49 89 99 1568 0 • Fax: +49 89 99 1568 33
Website: www.brainlab.com

EXHIBITORS

DePuy, a Johnson & Johnson Company 3
P.O. Box 988, Warsaw, IN 46581-0988, USA
Phone: 1-574-372-7147 • Fax: 1-574-372-7382
Website: www.depuy.com

EBI L.P. 11
100 Interpace Parkway, Parsippany, NJ 07054, USA
Phone: 1-800-526-2579 • Fax: 1-973-316-2452
Website: www.ebimedical.com

Innomed, Inc. 9
103 Estus Drive, Savannah, GA 31404, USA
Phone: 1-800-548-2362 • Fax: 1-912-236-7766
Website: www.innomed.net

Medical Models Limited (MITA) 15
Unit F, 16 Crown Road, Twickenham, Middlesex TW1 3EE, United Kingdom
Phone: +44-208-752-1213 • Fax: +44-208-892-1208
Website: www.medical-models.com

Medtronic Surgical Navigation Technologies 1
826 Coal Creek Circle, Louisville, CO 80027, USA
Phone: 1-720-890-3200 • Fax: 1-720-890-3500
Website: www.stealthstation.com

ORTHOsoft 8
75 Queen Street, Suite 3300, Montreal QUEBEC H3C 2NG, CANADA
Phone: 1-514-861-4074 ext 243 • Fax: 1-514-866-2197
Website: www.orthosoft.ca

Pfizer, Inc. 14
New York, NY, USA

PI Precision Implants AG 4
Schachenallee 29, Aarau CH-5001, SWITZERLAND
Phone: +41-62-832-0606 • Fax: +41-62-832-0701
Website: www.pisystems.ch

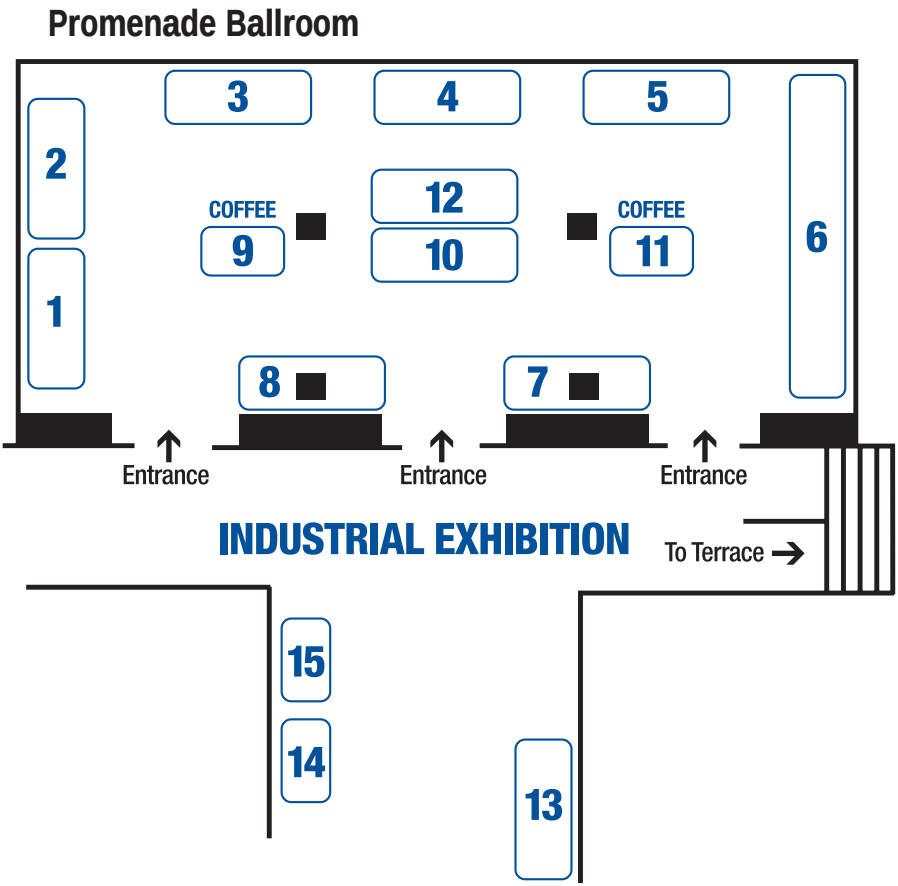
Praxim Medivision 13
486 High Plain Street, Walpole, MA 02081, USA
Phone: 1-508-660-1952 • Fax: 1-508-660-2783
Website: www.surgetics.com

Smith & Nephew 5
1450 Brooks Rd., Memphis, TN 38116, USA
Phone: 1-901-399-5195 • Fax: 1-901-399-1307
Website: www.smithnephew.com

Stryker 6
4100 E. Milham, Kalamazoo, MI 49001, USA
Phone: 1-269-323-7700 • Fax: 1-269-323-2482
Website: www.stryker.com

Zimmer 2
P.O. Box 708, Warsaw, IN 46581, USA
Phone: 1-574-372-4389 • Fax: 1-574-372-4804
Website: www.zimmer.com

INDUSTRIAL EXHIBITION FLOORPLAN



FACULTY

The faculty of the CAOS-International 2004 Conference is comprised of internationally renowned physicians and scientist widely recognized for their clinical and teaching expertise.

Conference Organizer

S. David Stulberg, M.D.
Professor, Clinical Orthopaedic Surgery
Northwestern University, Feinberg School of Medicine, USA

Technical Planning Committee

Norberto Confalonieri, M.D.	*Centro Traumatologico Ortopedico – I.C.P., ITALY*
Brian Davies, Ph.D.	*Imperial College, U.K.*
Florion Gebhard Ph.D.	*University of Ulm, GERMANY*
Leo Joskowicz, Ph.D.	*The Hebrew University of Jerusalem, ISRAEL*
David Kahler, M.D.	*University of Virginia, USA*
Martin Krismer, M.D.	*Medical University of Innsbruck, AUSTRIA*
Frank Langlotz, Ph.D.	*University of Bern, SWITZERLAND*
Lutz-P. Nolte, Ph.D.	*University of Bern, SWITZERLAND*
S. David Stulberg, M.D.	*Northwestern University, Feinberg School of Medicine, USA*
Michael Swank, M.D.	*Cincinnati Orthopaedic Research Institute, USA*

Keynote Lecturer 1

Jürgen Fritz, M.D.
TETEC AG, GERMANY
BIOLOGY MEETS COMPUTER NAVIGATION

Keynote Lecturer 2

Peter S. Walker, Ph.D.
New York University Medical Center & Hospital for Joint Diseases, USA
ADAPTATION OF TOTAL KNEE DESIGN FOR MIS AND CAOS

Faculty

Please find the presenters underlined in the program and listed on page 11 in Faculty/Speaker Disclosure Statement and Disclosure for Discussions of Off-Label/Investigational use of Pharmaceutical Products

Photo by Mike Gustafson

CME & ACCREDITATION

Learning Objectives

Upon completion of this activity, participants will be able to:

- *Develop the basic skills necessary to utilize CAOS techniques in an operating room setting.*
- *Obtain an international perspective on the state of the art, as well as future, developments and clinical directions in CAOS.*
- *Participants will recognize clinical and technical issues and emerging trends in CAOS and learn the integration of CAOS and Minimally Invasive Surgery (MIS).*

Joint Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of Northwestern University, Feinberg School of Medicine and Northwestern Arthritis and Rehabilitation Institute. Northwestern University, Feinberg School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

Credit Hour Statement:

Northwestern University, Feinberg School of Medicine designates this educational activity for a maximum of 19.5 category 1 credits toward the AMA Physician's Recognition Award. Each physician should claim only those credits that he/she actually spent in the activity.

CME Certificates:

In order to obtain your CME certificate for this activity, it will be necessary for you to complete the Credit Hour Form that is included in your conference materials. Forms should be completed in full and returned to the registration desk at the end of the meeting. Certificates will be mailed 3-4 weeks following the conference to the address provided on your registration form.

Non-US Physicians:

The American Medical Association has determined that physicians not licensed in the US who participate in this CME activity are eligible for AMA PRA category 1 credit.

FACULTY / SPEAKER DISCLOSURE STATEMENT AND DISCLOSURE FOR DISCUSSIONS OF OFF-LABEL / INVESTIGATIONAL USE OF PHARMACEUTICAL PRODUCTS

In accordance with ACCME Standards for Commercial Support of Continuing Medical Education and the Feinberg School of Medicine's disclosure policy for CME activities, faculty members have been asked to disclose any relationship they may have with commercial supporters of this CME activity or with companies providing products or medical equipment that may have relevance to the content of their presentations. Such disclosure is intended to provide participants with sufficient information to evaluate whether any given presentation has been influence by the faculty's relationships(s) or financial interest with said companies.

This activity may include information regarding the off-label and/or investigational use(s) or various pharmacologic agents. The faculty have disclosed below if they will be discussing a product which is still investigational or not labeled for the use under discussion

Note: *If the disclosure information was not received before the production of the syllabus, "refused to disclose" is listed below and the session co-chair will state the faculty's disclosure information during the introduction of their presentation.*

Ali, Murali, M.D.	States there is nothing to disclose
Amiot, Louis-Philippe, M.D.	Has a significant relationship as a Consultant and Major Stock Holder for OrthoSoft and may refer to it in his presentation.
Anderegg, Christoph	States there is nothing to disclose
Anderson, Donald, Ph.D.	States there is nothing to disclose
Bargar, William, M.D.	Has a significant relationship as a Consultant with Integrated
Barrera, Osvaldo Andres	Will be discussing a product which is still investigational or not labeled for the use under discussion. Some of the technology investigated in this work may end up being in a commercial product in the future. Surgical Systems, Inc. and may refer to it in his presentation.
Bäthis, Holger, M.D.	Has a significant relationship receiving Research Support from BrainLAB AG, Germany and may refer to it in his presentation. The system is not labeled for use in revision surgery.
Bicknell, Ryan, M.D.	States there is nothing to disclose
Bignozzi, Simone, Dipl.-Ing.	Has a significant relationship and receives Grant/Research Support from DePuy International Ltd. and may refer to it in his presentation.
Blendea, Sorin, M.D.	States there is nothing to disclose
Blouin, Manon Sonia	States there is nothing to disclose
Boyer, Anthony, Ph.D.	Has a significant relationship and receives Grant/Research Support from Praxim-Medivision and may refer to it in his presentation.
Brander, Victoria, M.D.	States there is nothing to disclose
Broers, Holder	Has a significant relationship with financial or material interest with PI Systems (CH) and could be perceived as a conflict of interest.
Chan, Carolyn, MSc.	States there is nothing to disclose
Chauhan, Sandeep, F.R.C.S.	Has a significant relationship and receives Grant/Research Support from Stryker Orthopaedics and may refer to it in his presentation.
Citak, Musa, M.D.	States there is nothing to disclose
Clemens, Ulrich, M.D.	States there is nothing to disclose
Cobb, Justin, F.R.C.S.	Has a significant relationship as a Major Stock Holder of ACROBOT and could be perceived as a conflict of interest.
Colombet, Philippe, M.D.	Has a significant relationship as a Consultant for Praxim and may refer to it in his presentation.
Confalonieri, Norberto, M.D.	States there is nothing to disclose
Cossey, Andrew, F.R.C.S.	States there is nothing to disclose
Currie, John	States there is nothing to disclose
de la Fuente, Matias, Dipl.-Ing.	States there is nothing to disclose
de Steiger, Richard, M.B.B.S.	States there is nothing to disclose
Delp, Scott, Ph.D.	States there is nothing to disclose
Douta, Gisele, Dipl.-Ing.	States there is nothing to disclose
Dries, Sebastian P.M., M.D.	States there is nothing to disclose
Ebert, Brenton	States there is nothing to disclose
Eckman, Kort	States there is nothing to disclose

Forman, Rachel	States there is nothing to disclose
Fredella, Nicola, M.D.	States there is nothing to disclose
Frigo, Carlo, Ph.D.	States there is nothing to disclose
Fritz, Jürgen, M.D.	Has a significant relationship as a Consultant with Aesculap AG & Co. Kg and TETEC Ag. and may refer to it in his presentation.
Gasparini, Giorgio, M.D.	States there is nothing to disclose
Geerling, Jens, M.D.	States there is nothing to disclose
Gérard, Romain, M.D.	States there is nothing to disclose
Glossop, Neil, Ph.D.	Has a significant relationship as a Major Stock Holder with Traxtal Technologies Inc. and could be perceived as a conflict of interest.
Gómez, Emilio, Ph.D.	States there is nothing to disclose
Gramlich, Hans, Dipl.-Ing	Has a significant relationship as a Consultant for PI-AG, Intraplant AG Switzerland and may refer to it in his presentation.
Gruetzner, Paul Alfred, M.D.	States there is nothing to disclose
Hafez, Mahmoud, F.R.C.S.	States there is nothing to disclose
Haider, Hani, Ph.D.	Will be discussing a product which is still investigational or not labeled for the use under discussion. Some of the technology investigated in my talk may end up being in a commercial product in the future - not yet.
Hananouchi, Takehito, M.D.	States there is nothing to disclose
Harris, Simon, Ph.D.	Has a significant relationship as a Major Stock Holder with Acrobot Company and could be perceived as a conflict of interest.
Heining, Sandro-Michael, M.D.	States there is nothing to disclose
Henckel, Johann, M.B.B.S.	States there is nothing to disclose
Hodgson, Antony, Ph.D.	States there is nothing to disclose
Honl, Matthias, M.D.	States there is nothing to disclose
Hsu, Robert Wen-Wei, M.D.	States there is nothing to disclose
Hüfner, Tobias, M.D.	States there is nothing to disclose
Ito, Masayuki, M.D.	Has a significant relationship and receives Grant/Research Support from BrainLAB and Zimmer Japan and may refer to it in his presentation.
Jaramaz, Branislav, Ph.D.	States there is nothing to disclose
Jenny, Jean-Yves, M.D.	Has a significant relationship as a Consultant and receives other Financial or Material Interest with AESCULAP and may refer to it in his presentation.
Joseph, Robert	Has a significant relationship receiving Grant/Research Support from BBRAUN/AESCULAP and may refer to it in his presentation.
Judet, Henri, M.D.	States there is nothing to disclose
Kagiyama, Yoshiyuki	States there is nothing to disclose
Kahler, David, M.D.	Has a significant relationship as a Consultant and for BrainLAB (pending) and may refer to it in his presentation.
Kawakami, Hideo, M.D.	States there is nothing to disclose
Kendoff, Daniel, M.D.	States there is nothing to disclose
Keppler, Peter, M.D.	States there is nothing to disclose
Kessler, Oliver, M.D.	Has a significant relationship as a Consultant, receives Grant/Research Support and is on the Speaker Bureau for Stryker Navigation and may refer to it in his presentation and could be perceived as a conflict of interest.
Kfuri, Maurício, M.D.	States there is nothing to disclose
Klima, Stefan	States there is nothing to disclose
Ko, Byung-Hoon	States there is nothing to disclose
Koo, Terry, Ph.D.	States there is nothing to disclose
Koyama, Tsuyoshi, M.D.	States there is nothing to disclose
Krackow, Kenneth, M.D.	Has a significant relationship as a Consultant with Stryker Orthopedics and may refer to it in his presentation and could be perceived as a conflict of interest.
Kumar, T. Rajamani, M.Tech	States there is nothing to disclose
Lampe, Frank, M.D.	States there is nothing to disclose
Langlotz, Frank, Ph.D.	States there is nothing to disclose
Lavallée, Stéphane, Ph.D.	Has a significant relationship and receives Grant/Research Support from Praxim-Medivision and may refer to it in his presentation.
Liebergall, Meir, M.D.	States there is nothing to disclose
Liu, Wenyong, Ph.D.	States there is nothing to disclose
Malek, Sabur, M.R.C.S.	States there is nothing to disclose
Manili, Mario, Ph.D.	States there is nothing to disclose
Marcacci, Maurilio, M.D.	States there is nothing to disclose
Martelli, Sandra	States there is nothing to disclose
Martin, Arno, M.D.	States there is nothing to disclose
Matsuda, Shuichi, M.D.	States there is nothing to disclose

Mattes, Thomas, M.D.	Has a significant relationship and receives Grant/Research Support from CenterPulse/Zimmer and may refer to it in his presentation.
McCusker, Scott B.	States there is nothing to disclose
Merloz, Philippe, Ph.D., M.D.	States there is nothing to disclose
Mihalko, Willaim, M.D., Ph.D.	Has a significant relationship as a Consultant with Stryker Orthopedics and may refer to it in his presentation and could be perceived as a conflict of interest.
Murphy, Stephen, M.D.	States there is nothing to disclose
Nahum, Bertin, Dipl.-Ing	Will be discussing a product which is still investigational or not labeled for the use under discussion. The product he will be discussing is a surgical robot not yet cleared for clinical use.
Natanzon, Alexander, Ph.D.	Has a significant relationship as Owner and CEO of ANAV Software Solutions, receives Research & Development Support from Mazor Surgical Technologies and may refer to it in his presentation.
Nogler, Michael, M.D.	Has a significant relationship as a Consultant for Stryker Corp. and may refer to it in his presentation.
Nolte, Lutz Peter, Ph.D.	States there is nothing to disclose
Oberst, Michael, M.D.	Travel and accommodations were paid by BrainLAB and may refer to his relationship with them in his presentation.
Ohnsorge, Jak, M.D.	Has a significant relationship and receives Grant/Research Support from Medtronic SNT and may refer to it in his presentation.
Okada, Toshiyuki	States there is nothing to disclose
Orlandini, Luca Claudio, M.D.	Has a significant relationship as an Employee of Medacta International S.A. and may refer to it in his presentation and could be perceived as a conflict of interest.
Pakvis, Dean, M.D.	States there is nothing to disclose
Park, Sukhoon	States there is nothing to disclose
Picard, Frederick, M.D.	Has a significant relationship as a Consultant for AESCULAP/B.BRAUN and may refer to it in his presentation and could be perceived as a conflict of interest.
Plaskos, Christopher	Has a significant relationship as a Consultant with Praxim-Medivision and may refer to it in his presentation.
Plaweski, Stéphane, M.D.	States there is nothing to disclose
Radermacher, Klaus, Ph.D.	States there is nothing to disclose
Rampersaud, Yoga Raja, M.D.	Has a significant relationship as a Consultant for Medtronic Sofamor Danek and may refer to it in his presentation and could be perceived as a conflict of interest.
Ritter, Lutz, M.D.	States there is nothing to disclose
Sagbo, Serge, Dipl.-Ing.	States there is nothing to disclose
Sahay, Alind	Has a significant relationship as a Consultant with Integrated Surgical Systems, Inc. and may refer to it in his presentation. Will be discussing a product which is still investigational or not labeled for the use under discussion. Robodoc is currently under investigational use under IDE 6000971
Sakai, Shinsuke, M.D.	States there is nothing to disclose
Sato, Takashi, M.D.	States there is nothing to disclose
Sauret, Veronique, Ph.D.	States there is nothing to disclose
Schkommodau, Erik, Dipl.-Ing.	States there is nothing to disclose
Shin, H.C., M.D.	States there is nothing to disclose
Shoham, Moshe, Ph.D.	Has a significant relationship as a Consultant and has other financial or material interest with Mazor Surgical Technologies and may refer to it in his presentation.
Siston, Robert	States there is nothing to disclose
Sobue, Ten, M.D.	States there is nothing to disclose
Song, Eun Kyoo, M.D.	States there is nothing to disclose
Stiehl, James, M.D.	Has a significant relationship as a Consultant with Zimmer, Inc. and could be perceived as a conflict of interest.
Stifter, Jan, Dipl.-Ing	Has a significant relationship as an Employee of PI Precision Implants AG and may refer to it in his presentation.
Stindel, Eric, M.D., Ph.D.	Has a significant relationship as a Consultant for Praxim and may refer to it in his presentation.
Stöckle, Ulrich, Ph.D.	States there is nothing to disclose
Stulberg, Bernard, M.D.	Has a significant relationship as a Consultant for Stryker Corporation and may refer to it in his presentation.
Sugano, Nobuhiko, M.D.	States there is nothing to disclose
Sun, Lei, Ph.D.	States there is nothing to disclose
Swank, Michael, M.D.	Has a significant relationship as a Consultant and receives Grant/Research Support from DePuy Orthopaedics, and BrainLAB, Inc. and may refer to it in his presentation and could be perceived as a conflict of interest.

Takao, Masaki, M.D.	States there is nothing to disclose
Talib, Haydar	States there is nothing to disclose
Tang, Thomas	States there is nothing to disclose
Tannast, Moritz, M.D.	States there is nothing to disclose
Tarte, Ségoléne, Dipl.-Math Ing.	States there is nothing to disclose
Taylor, Russell, Ph.D.	Has a significant relationship as a member of the Scientific Advisory Board of Integrated Surgical Systems and of Image Guide, Inc., and he consequently has a small financial interest in these companies, and he may join other Advisory Boards. Some of his patents have been licensed by Image Guide, Inc. ISS, IG, GE, Siemens, Medtronic, Burdette Medical, and several other companies whose systems were discussed in this talk are affiliates of the NSF CISST ERC, of which Dr. Taylor is the Director.
Taylor, William, Ph.D.	States there is nothing to disclose
Tayot, Olivier, Ph.D.	Has a significant relationship as a Consultant with Amplitude whose product may be refered to in the presentation.
Thornberry, Robert, M.D.	Has a significant relationship as a Consultant with Smith & Nephew and may refer to it in his presentation.
Tokunaga, Kunihiko, M.D.	Has a significant relationship and receives Grant/Research Support from BrainLAB and Zimmer Japan and may refer to it in his presentation.
Tsai, Tsung-Ting, M.D.	States there is nothing to disclose
van de Kraats, Everine	Has a significant relationship and receives Grant/Research Support from Philips Medical Systems and may refer to it in his presentation.
van Walsum, Theo, Ph.D.	Will be discussing a product which is still investigational or not labeled for the use under discussion. Accuracy results of navigation on 3DRX data acquired with a prototype Philips mobile C-arm with propeller motion are discussed.
Viskontas, Darius, M.D.	States there is nothing to disclose
von Recum, Jan, Ph.D.	States there is nothing to disclose
Walker, Peter, Ph.D.	Has a significant relationship as a Consultant and receives Grant/Research Support from Zimmer and may refer to it in his presentation.
Wang, Gongli, Dipl.-Ing.	States there is nothing to disclose
Weil, Yoram, M.D.	States there is nothing to disclose
Wendl, Klaus, M.D.	States there is nothing to disclose
Wiesel, Ulrich, M.D.	States there is nothing to disclose
Wixson, Richard, M.D.	Has a significant relationship as a Consultant, receives Grant/Research Support and is on the Speaker Bureau for Stryker Corporation and may refer to it in his presentation and could be perceived as a conflict of interest.
Wolf, Alon, Ph.D.	States there is nothing to disclose
Yang, Kuang-Ying, M.D.	States there is nothing to disclose
Yaniv, Ziv	Has a significant relationship as a Consultant for Mazor Surgical Technologies, ISRAEL and may refer to it in his presentation.
Zaffagnini, Stefano, Ph.D.	States there is nothing to disclose
Zheng, Guoyan, Ph.D.	States there is nothing to disclose
Zini, Raul, Ph.D.	States there is nothing to disclose

Photo by Mike Gustafson

PROGRAM SCHEDULE

Wednesday, June 16

4:00 p.m. – 6:30 p.m. **Registration and Welcome Reception**

Thursday, June 17

6:45 a.m. **Registration**
Coffee Break in the Industrial Exhibition

7:15 a.m. **Welcome and Introduction**
S. David Stulberg
Conference Chairman

Video Session 1

Session Co-Chairs:
Scott L. Delp, Ph.D., *Stanford University, USA*
Lars Perlick, M.D., *University of Regensburgh, GERMANY*

7:30 a.m. **ORTHOPILOT LIGAMENT BALANCING OF THE COLUMBUS KNEE - *Aesculap***
F. Lampe, *Eilbek General Hospital, GERMANY*

IMAGE FREE BRAINLAB TKA - *Brainlab*
M. Swank, *Cincinnati Orthopaedic Research Institute, USA*

NAVITRAK IMAGE FREE TKA - *OrthoSOFT*
M. Bolognesi, *University of Utah, USA*

Session 1 - Total Knee Replacement Part 1: Clinical Results

Session Co-Chairs:
Jean-Yves Jenny, M.D., *Center for Orthopedic and Trauma Surgery of Strasbourg, FRANCE*
David Lionberger, *Baylor College of Medicine, USA*

8:00 a.m. **THE USE OF COMPUTER NAVIGATION IN PREVENTING MALALIGNMENT IN UNICOMPARTMENTAL KNEE ARTHROPLASTY**
A.J. Cossey and A.J. Spriggins
Sportsmed SA Hospital, AUSTRALIA

8:10 a.m. **ROBOT ASSISTED MINIMALLY INVASIVE UNICOMPARTMENTAL KNEE ARTHROPLASTY: RESULTS OF FIRST CLINICAL TRIALS**
J. Cobb[1], J. Henckel[1], R. Richards[1], S.J. Harris[2], M. Jakopec[2], F. Rodriguez y Baena[1], M.P.S.F. Gomes[2], and B.L. Davies[2]
[1]*University College London Hospitals Trust, UK* and [2]*Imperial College, UK*

8:20 a.m. **EVALUATION OF THE USE OF THE PRAXIM NAVIGATION SYSTEM WITH THE ROTATING PLATFORM TRI CCC TKR PROSTHESIS**
Ph. Colombet and F. Rocha Amador
Centre de Chirurgie Orthopèdique et Sportive, FRANCE

8:30 a.m. **A NON IMAGE BASED KNEE NAVIGATION SYSTEM WITH INCLUSION OF GAP AND SOFT TISSUE BALANCING USING A MOBILE BEARING TOTAL KNEE SYSTEM**
R.K. Miehlke, U. Clemens, and R. Geyer
St. Josef-Stift, GERMANY

8:40 a.m **COMPUTER NAVIGATION OF THE TIBIA CUT FIRST TECHNIQUE IN MOBILE BEARING TOTAL KNEE ARTHROPLASTY**
J.B. Stiehl
Columbia St. Mary's Hospital, USA

8:50 a.m. **CT-BASED PLANNING OF A SINGLE-RADIUS FEMORAL COMPONENT IN TOTAL KNEE ARTHROPLASTY USING THE ROBODOC SYSTEM**
T. Hananouchi[1], N. Sugano[2], A. Kakimoto[1], N. Nakamura[1], T. Nishii[2], H. Miki[2], T. Ochi[2], and H. Yoshikawa[2]
[1]*Kyowakai Hospital, JAPAN* and
[2]*Osaka University Graduate School of Medicine, JAPAN*

9:00 a.m. **NAVIGATION ASSISTED MINIMALLY INVASIVE TOTAL KNEE ARTHROPLASTY**
E.K. Song, S.M. Rowe, J.V. Chung, S.T. Jung, and J.K. Seon
Chonnam National University Hospital, KOREA

9:10 a.m. **Discussion**

9:30 a.m. **Coffee Break in the Industrial Exhibition**

Keynote Lecturer 1

10:00 a.m. **BIOLOGY MEETS COMPUTER NAVIGATION**
Jürgen Fritz, M.D.
TETEC AG, GERMANY

Session 2 - Accuracy of Registration and Navigation

Session Co-Chairs:
Stéphane Lavallée, Ph.D., *Praxim Medivision, USA*
Nobuhiko Sugano, M.D., *Osaka University Medical School, JAPAN*

10:30 a.m. **PELVIC LOCALIZATION ERRORS IN VIRTUAL FLUOROSCOPY AND THEIR IMPACT ON CUP PLACEMENT**
K. Eckman[1], A. Mor[2], D. Davidson[2] and B. Jaramaz[1,2]
[1]*Carnegie Mellon University, USA* and [2]*The Western Pennsylvania Hospital, USA*

10:40 a.m. **FLUOROSCOPIC NAVIGATION IS MORE ACCURATE AND EFFICIENT THAN STANDARD FREEHAND TARGETING**
D.M. Kahler[1], W.M. Ricci[2], T.A. Russell[3], L. Terrill-Grisoni[4], and P. Culley[4]
[1]*University of Virginia, USA*, [2]*Washington University, USA,* [3]*Campbell Clinic, USA*, and
[4]*Smith and Nephew Orthopaedics, USA*

10:50 a.m. **ACCURACY OF NAVIGATION ON 3DRX DATA ACQUIRED WITH A MOBILE PROPELLER C-ARM**
T. Van Walsum[1], E.B. Van de Kraats[1], B. Carelsen[2], S.N. Boon[3], N. Noordhoek[3], and W.J. Niessen[1]
[1]*University Medical Center Utrecht, THE NETHERLANDS,*
[2]*Academic Medical Center, THE NETHERLANDS,* and [3]*Philips Medical Systems, THE NETHERLANDS*

11:00 a.m. **ULTRASOUND-BASED RECONSTRUCTION AND REGISTRATION OF 3D BONE ANATOMY USING STATISTICAL SHAPE MODELS**
C.S.K. Chan[1], P.J. Edwards[1,2], D.C. Barratt[1], M. Slomczykowski[3], and D.J. Hawkes[1]
[1]*King's College London, UK*, [2]*Imperial College London, UK*, and
[3]*i-Orthopaedics, DePuy, a Johnson & Johnson Company, GERMANY*

11:10 a.m. **EVALUTATION OF REGISTRATION TECHNIQUES IN A ROBOTIC APPROACH TO PELVIC OSTEOLYSIS**
N.A. Ramey[1], M. Li[1], S.K. Prasad[1], F.J. Frassica[2], and R.H. Taylor[1]
[1]*Johns Hopkins University, USA* and [2]*Johns Hopkins Medical Institutions, USA*

11:20 a.m. **NOVEL REGISTRATION SYSTEM FOR ROBOTICALLY-ASSISTED SURGERY**
A.N. Natanzon[1], A.V. Vitchevsky[1], and E. Batkilin[2]
[1]*ANAV Software Solutions, ISRAEL* and [2]*Masor Surgical Technologies, ISRAEL*

11:30 a.m. **ESTIMATING CUP ALIGNMENT ERRORS CAUSED BY ANATOMICAL LANDMARKS LOCALIZATION DURING TOTAL HIP ARTHROPLASTY**
A. Wolf, A.M. DiGioia, III, A.B. Mor, and B. Jaramaz
The Western Pennsylvania Hospital, USA

11:40 a.m. **Discussion**

12:00 p.m. **Lunch Break and General Assembly of CAOS International**

Poster Exhibition – Part 1

1:30 p.m. See page 26 for complete listing of Special Posters and page 27 for Contributed Posters

Session 3 - Emerging Technologies

Session Co-Chairs:
Leo Joskowicz, Ph.D., *The Hebrew University of Jerusalem, ISRAEL*
Christian Krettek, M.D., *Hannover Medical School, GERMANY*

2:30 p.m. **ROBOT-ASSISTED DISTAL LOCKING OF LONG BONE INTRAMEDULLARY NAILS: LOCALIZATION, REGISTRATION, AND IN-VITRO EXPERIMENTS**
Z. Yaniv and L. Joskowicz
Hebrew University of Jerusalem, ISRAEL

2:40 p.m. **EXPANDING THE INTRAOPERATIVE FIELD-OF-VIEW OF OPTICAL TRACKING SYSTEMS**
F. Langlotz and C.M. Kereliuk
University of Bern, SWITZERLAND

2:50 p.m. **ECHOMORPHING: INTRODUCING AN INTRA-OPERATIVE IMAGING MODALITY TO RECONSTRUCT 3D BONE SURFACES FOR MINIMALLY INVASIVE SURGERY**
S. Lavallée[1], P. Merloz[2], E. Stindel[3], P. Kilian[1], J. Troccaz[4], P. Cinquin[4], F. Langlotz[5], and L.P. Nolte[5]
[1]*Praxim Medivision, FRANCE*, [2]*Grenoble Hospital, FRANCE*, [3]*Brest Hospital, FRANCE*, [4]*University of Joseph Fourier, FRANCE*, and [5]*University of Bern, SWITZERLAND*

3:00 p.m. **A PRE-CALIBRATED MOBILE LASER GUIDANCE SYSTEM FOR SURGICAL NAVIGATION**
N. Sugano[1], Y. Nakajima[1], Y. Sato[1], T. Koyama[1], Y. Momoi[2], K. Yonenobu[3], I. Sakuma[4], and S. Tamura[1]
[1]*Osaka University, JAPAN*, [2]*Hitachi, Ltd., JAPAN*, [3]*Osaka Minami National Hospital, JAPAN,* and [4]*University of Tokyo, JAPAN*

3:10 p.m. **Discussion**

Session 4 - Osteotomies

Session Co-Chairs:
Randy Ellis, Ph.D., *Queen's University, CANADA*
Dominique Saragaglia, M.D., B. *Braun Medical, FRANCE*

3:20 p.m. **A GENERIC CT-FREE INTRAOPERATIVE PLANNING AND NAVIGATION SYSTEM FOR HIGH TIBIAL OSTEOTOMY**
G. Wang[1], G. Zheng[1], P.A. Grützner[2], U.W. Müller-Alsbach[3], A.E. Staubli[3], and L.P. Nolte[1]
[1]*University of Bern, SWITZERLAND*, [2]*University of Heidelberg, GERMANY*, and [3]*Kantonsspital Luzern, SWITZERLAND*

3:30 p.m. **NAVIGATED HIGH TIBIAL OSTEOTOMY-EXPERIMENTAL COMPARISON TO THE CONVENTIONAL TECHNIQUE**
D. Kendoff[1], S. Hankemeier[1], G. Wang[2], G. Zheng[2], J. Geerling[1], T. Hüfner[1], L. Nolte[2], and C. Krettek[1]
[1]*Hannover Medical School, GERMANY* and [2]*University of Bern, SWITZERLAND*

3:40 p.m. **COMPUTER ASSISTANCE IN TRIPLE PELVIC OSTEOTOMY: NO INTRA AND DIRECT POST OPERATIVE BENEFITS**
D. Pakvis[1], G. Van Hellemondt[2], P. Anderson[2], and M. De Kleuver[2]
[1]*University Hospital Nijmegen, THE NETHERLANDS*, and [2]*St. Maartens Kliniek, THE NETHERLANDS*

3:50 p.m. **Discussion**

Industrial Workshops - Session 1

Workshop I	Aesculap OrthoPilot® TKA Featuring Soft Tissue Balancing
Workshop II	Benefits and Applications of CAS in Trauma Surgery - Scientific Presentation and Hands-On - BrainLab
Workshop III	The Benefits and Practical Application of Adopting CAS into Your Total Joint Practice Today, DePuy, a Johnson & Johnson Company
Workshop IV	ORTHOsoft Hip and Knee Multiplatform Applications

Your name badge indicates which group you are in. Please see below schedule for today's group location and times. The Workshop floorplans are on pages 38 and 39.

4:15 p.m. **Rotation A**

Workshop I	Group 1
Workshop II	Group 2
Workshop III	Group 3
Workshop IV	Group 4

4:50 p.m. **Rotation B**

Workshop I	Group 2
Workshop II	Group 3
Workshop III	Group 4
Workshop IV	Group 1

5:25 p.m. **Rotation C**

Workshop I	Group 3
Workshop II	Group 4
Workshop III	Group 1
Workshop IV	Group 2

6:00 p.m. **Rotation D**

Workshop I	Group 4
Workshop II	Group 1
Workshop III	Group 2
Workshop IV	Group 3

6:30 p.m. **Adjourn for the day**

Photo by Mike Gustafson

Friday, June 18

6:45 a.m. **Registration**
Coffee Break in the Industrial Exhibition

7:15 a.m. **Introduction**

Video Session 2

Session Co-Chairs:
Frederic Picard, M.D., *Polyclinique de la Foret, FRANCE*
Klaus Radermacher, Ph.D., *University Clinic Aachen, GERMANY*

7:30 a.m. **EXPERIENCES WITH NAVIGATED AND FORCE CONTROLLED LIGAMENT BALANCING IN TKR - *PI Precision Implants AG***
P. Ritschl, *Orthopädisches Krankenhaus Gersthof, AUSTRIA*

IMAGE FREE THA - *Stryker*
R. Wixson, *Northwestern University, Feinberg School of Medicine, USA*

IMAGE-BASED THR - *BrainLAB*
S.B. Murphy, *New England Baptist Hospital, USA*

Session 5 - Total Hip Replacement

Session Co-Chairs:
Anthony M. DiGioia, M.D., *The Western Pennsylvania Hospital, USA*
Peter S. Walker, Ph.D., *New York University School of Medicine, USA*

8:00 a.m. **MINIMALLY INVASIVE SURGERY AND NAVIGATION IN TOTAL HIP PROSTHESIS**
H. Judet
Clinique Jouvenet Paris, FRANCE

8:10 a.m. **IMAGELESS COMPUTER NAVIGATED TOTAL HIP REPLACEMENT WITH A LIMITED POSTERIOR APPROACH**
R.L. Wixson[1] and M.A. MacDonald[2]
[1]*Northwestern University, USA* and [2]*Northwestern Center for Orthopedics, USA*

8:20 a.m. **COMPUTER ASSISTED TOTAL HIP REPLACEMENT - PLANNING AND OUTCOME**
M.L. Swank
Cincinnati Orthopaedic Research Institute, USA

8:30 a.m. **MEASUREMENTS OF ACETABULAR CUP ALIGNMENT AFTER TOTAL HIP ARTHROPLASTY USING CT/X-RAY MATCHING**
S. Blendea[1], K. Eckman[2], B. Jaramaz[3], T.J. Levison[3], and A.M. DiGioia, III[3]
[1]*Centre Hospitalier Universitaire Grenoble, FRANCE*, [2]*Carnegie Mellon University, USA*, and [3]*The Western Pennsylvania Hospital, USA*

8:40 a.m. **COMPARISON OF THR-CUP-ORIENTATION USING DIFFERENT NAVIGATION SYSTEMS**
M. Honl[1], K. Schwieger[2], S. Dries[1], C. Gauck[1], F. Lampe[1], M.M. Morlock[3], E. Hille[1], and M. Wimmer[4]
[1]*Eilbek General Hospital, GERMANY*, [2]*AO Research Institute, SWITZERLAND*, [3]*Technical University Hamburg-Harburg, GERMANY*, and [4]*Rush Presbyterian St Lukes Medical Center, USA*

8:50 a.m. **COMPARISON OF ROBOTIC VERSUS MANUAL IMPLANTATION OF CEMENTLESS PRIMARY TOTAL HIP REPLACEMENT - A PERSPECTIVE CLINICAL STUDY**
S. Dries[1], M. Honl[1], K. Scwieger[2], F. Lampe[1], C. Gauck[1], M.M. Morlock[3], M. Wimmer[4], and E. Hille[1]
[1]*Eilbek General Hospital, GERMANY,* [2]*AO Research Institute, SWITZERLAND*, [3]*Technical University Hamburg-Harburg, GERMANY*, and [4]*Rush Presbyterian St Lukes Medical Center, USA*

9:00 a.m. **COMPARISON OF CT-BASED AND FLUOROSCOPIC-BASED SURGICAL NAVIGATION FOR THR**
S.B. Murphy
New England Baptist Hospital, USA

9:10 a.m. **Discussion**

9:30 a.m. **Coffee Break in the Industrial Exhibition**

Keynote Lecturer 2

10:00 a.m. **ADAPTATION OF TOTAL KNEE DESIGN FOR MIS AND CAOS**
Peter S. Walker, Ph.D.
New York University Medical Center & Hospital for Joint Diseases, USA

Session 6 - Novel Instrumentations

Session Co-Chairs:
David Kahler, M.D., *University of Virginia, USA*
Lutz-P. Nolte, Ph.D., *University of Bern, SWITZERLAND*

10:30 a.m. **DESIGN OF NAVIGATION SYSTEM FOR 5-IN-1 FEMORAL CUTTING GUIDE FOR TKA: ON THE IMPORTANCE OF DECOUPLING DEGREES OF FREEDOM**
A. Boyer[1], L. Vertallier[1], J.-N. Argenson[2], P. Henky[3], B. Perrin[4], J.M. Ferrier[4], P. Henri[1], and S. Lavallée[1]
[1]*Praxim Medivision, FRANCE*, [2]*The Aix-Marseille University, FRANCE*, [3]*Orthopaedic Service Sainte Odile Clinic Strasbourg, FRANCE*, and [4]*Zimmer, FRANCE*

10:40 a.m. **COMPUTER ASSISTED TOTAL KNEE REPLACEMENT: COULD A TWO-PIECE CUSTOM TEMPLATE REPLACE THE COMPLEX CONVENTIONAL INSTRUMENTATIONS?**
M.A. Hafez[1], K.L. Chelule[1], B.B. Seedhom[1], and K.P. Sherman[2]
[1]*University of Leeds, UK* and [2]*Royal Hull Hospitals and Hull University, UK*

10:50 a.m. **A COMPUTER-ASSISTED CONTROLLED DISTRACTION DEVICE TO GUIDE LIGAMENT BALANCING DURING KNEE ARTHROPLASTY**
C. Marmignon[1], A. Lemniei[1], P. Cinquin[1], and A. Hodgson[2]
[1]*TIMC Laboratory, FRANCE,* and [2]*University of British Columbia, CANADA*

11:00 a.m. **PRAXITELES: A UNIVERSAL BONE-MOUNTED ROBOT FOR IMAGE FREE KNEE SURGERY - REPORT ON FIRST CADAVER TRIALS**
C. Plaskos[1,2], E. Stindel[3], P. Cinquin[1], A.J. Hodgson[4], B. Faguer[2], and S. Lavallee[2]
[1]*Université Joseph Fourier, FRANCE*, [2]*Praxim-Medivision, FRANCE,*
[3]*Hôpital de la Cavale Blanche, FRANCE*, and [4]*University of British Columbia, CANADA*

11:10 a.m. **FREEHAND NAVIGATION CUTTING FOR TKR SURGERY WITHOUT JIGS: SIMULATION OF BONE SAW CUTTING**
H. Haider[1], O.A. Barrera[1], P.S. Walker[1,2], T.D. Sekundiak[1], and K.L. Garvin[1]
[1]*University of Nebraska Medical Center, USA* and
[2]*New York University Medical Center & Hospital for Joint Diseases, USA*

11:20 a.m. **COMPUTER-ASSISTED MINIMALLY INVASIVE CURETTAGE AND REINFORCEMENT OF THE FEMORAL HEAD OSTEO-NECROSIS WITH A NOVEL, EXPANDABLE BLADE TOOL**
T. Koyama, N. Sugano, H. Miki, T. Nishii, Y. Sato, H. Yoshikawa, S. Tamura, and T. Ochi
Osaka University Graduate School of Medicine, JAPAN

11:30 a.m. **Discussion**

11:45 a.m. **Lunch Break**

Poster Exhibition – Part 2

12:45 p.m. See page 26 for complete listing of Special Posters and page 27 for Contributed Posters

Session 7 - Total Knee Replacement Part 2: Accuracy Aspects

Session Co-Chairs:
Brian Davies, Ph.D., *Imperial College of Science/Acrobot Ltd., U.K.*
Kenneth Krackow, M.D., *Kaleida Health-Buffalo General Hospital, USA*

2:00 p.m. **DO NAVIGATION SYSTEMS ALWAYS TELL THE TRUTH? A STUDY OF INTRA AND INTER-SYSTEM VARIABILITY IN NAVIGATED TOTAL KNEE ARTHROPLASTY**
K.Y. Yang, S.J. Yeo, B.K. Tay, K.H. Seow, and N.N. Lo
Singapore General Hospital, SINGAPORE

2:10 p.m. **EFFECT OF ONE AND TWO PIN ANCHORING SYSTEMS ON TRACKER STABILITY DURING TKA COMPUTER NAVIGATION**
W.M. Mihalko[1], T. Duquin[1], J.R. Axelrod[1], M. Bayers-Thering[2], and K.A. Krackow[1,2]
[1]*University at Buffalo, USA* and [2]*Buffalo General Hospital, USA*

2:20 p.m. **THE RELIABILITY OF ANATOMIC LANDMARKS FOR DETERMINING FEMORAL IMPLANT ROTATION IN TKA SURGERY: IMPLICATIONS FOR CAOS TKA**
J. Currie[1], A. Varshney[1], S.D. Stulberg[1], A.D. Adams[2], and O. Woods[2]
[1]*Northwestern University, USA* and [2]*Northwestern Orthopaedic Institute, USA*

2:30 p.m. **THE INTER-OPERATIVE ACCURACY OF THE TRANS EPICONDYLAR AXIS USING COMPUTER ASSISTED SURGERY**
R.N. de Steiger[1] and A. Leung[2]
[1]*Royal Melbourne Hospital, AUSTRALIA* and [2]*BrainLab, HONG KONG*

2:40 p.m. **VARIABILITY OF DIGITAL X-RAY MEASUREMENT FROM CT MEASUREMENT OF MECHNICAL AXIS OF TOTAL KNEE ARTHROPLASY**
R.L. Thornberry
Florida State University School of Medicine, USA

2:50 p.m. **COMPUTER ASSISTED GAP EQUALIZATION (CAGE) IN TOTAL KNEE ARTHROPLASTY**
D.G. Viskontas[1], T.V. Skrinskas[1], D.G. Chess[1], J.A. Johnson[1], G.J. King[1], and M.J. Winemaker[2]
[1]*University of Western Ontario, CANADA* and [2]*McMaster University, CANADA*

3:00 p.m. **Discussion**

Photo by Todd Rosenberg

Industrial Workshops - Session 2

Workshop V	Force Controlled Ligament Balancing in Navigated TKR with PiGalileo PI Precision Implants
Workshop VI	Stryker Navigation: Principles and Practice
Workshop VII	Zimmer Ortho Guidance Systems Navigated MIS 2-Incision Total Hip Arthroplasty

Your name badge indicates which group you are in. Please see below schedule for today's group location and times. The Workshop floorplans are on pages 38 and 39.

3:45 p.m.

Rotation A

Workshop V	Group 1
Workshop VI	Group 2
Workshop VII	Group 3

4:20 p.m.

Rotation B

Workshop V	Group 2
Workshop VI	Group 3
Workshop VII	Group 1

4:55 p.m.

Rotation C

Workshop V	Group 3
Workshop VI	Group 1
Workshop VII	Group 2

5:25 p.m. **Adjourn for the day**

6:45 p.m. **Buses leave from the front entrance of the Westin Chicago River North**

7:00 p.m. - 11:00 p.m. **M.E. Müller Awards Banquet at the John G. Shedd Aquarium**

The Conference Banquet is scheduled for Friday evening at the world famous John G. Shedd Aquarium. The Shedd Aquarium offers the world's largest array of more than 8,000 aquatic mammals, reptiles, amphibians, invertebrates and fish. The Shedd's magnificent Oceanarium is the world's largest marine mammal pavilion and is home to Beluga whales, dolphins, Alaskan sea otters, seals and penguins.

Shuttle buses will depart from the main entrance of the Westin Chicago River North at 6:45 p.m.
The last shuttle will leave the Aquarium at 11:00 p.m.

This event is included in the registration fee.
Additional tickets may be purchased for guests at the registration desk.
Guest Banquet Ticket $60.00

Photo by Vito Palmisano

Saturday, June 19

6:45 a.m. **Registration**
Coffee Break in the Industrial Exhibition

7:15 a.m. **Introduction**

Video Session 3

Session Co-Chairs:
Peter Ritschl, M.D., *Orthopadisches Krankenhaus Gersthof, AUSTRIA*
Neil Glossop, Ph.D., *Traxtal Technologies LLC, USA*

7:30 a.m. **IMAGE BASED 2 INCISION THA FROM MEDTRONICS - Medtronics/Zimmer**
M. Libergahl, *Hadassah University Hospital, ISRAEL*

UNI-TKA - Aesculap
J.Y. Jenny, *Center for Orthopaedic and Trauma Surgery, FRANCE*

Session 8 - Total Knee Replacement Part 3: Comparative Studies

Session Co-Chairs:
Justin Cobb, *M.Ch. FRCS, UCL Hospitals, U.K.*
Sandra Martelli, *MSc., Istituti Ortopedici Rizzoli, ITALY*

8:00 a.m. **CAS-TKA REDUCES THE OCCURRENCE OF FUNCTIONAL OUTLIERS**
V.A. Brander[1], S.D. Stulberg[1], A. Adams[2], and O. Woods[2]
[1]*Northwestern University, USA* and [2]*Northwestern Orthopaedic Institute, USA*

8:10 a.m. **COMPUTER ASSISTED REVISION TOTAL KNEE ARTHROPLASTY: A COMPARISON WITH THE CONVENTIONAL TECHNIQUE**
H. Bäthis, L. Perlick, C. Lüring, M. Tingart, T. Kalteis, and J. Grifka
University of Regensburg, GERMANY

8:20 a.m. **CT-FREE VECTORVISION® SYSTEM FOR TOTAL KNEE ARTHROPLASTY - PROSPECTIVE COMPARATIVE STUDY OF NAVIGATED AND CONVENTIONAL IMPLANTATION**
A. Martin, C. Sukopp, and A. Von Strempel
University of Innsbruck, AUSTRIA

8:30 a.m. **NAVIGATED VERSUS FREEHAND IMPLANTATION IN TKA. FIRST RESULTS OF A CONTROLLED, RANDOMIZED STUDY**
M. Oberst, C. Bertsch, S. Wuerstlin, and U. Holz
Katharinenhospital Stuttgart, GERMANY

8:40 a.m. **CONVENTIONAL VERSUS COMPUTER ASSISTED TOTAL KNEE REPLACEMENT A RADIOGRAPHIC ANALYSIS OF POSTOPERATIVE ALIGNMENT**
F. Lampe, S.P.M. Dries, M. Honl, and E. Hille
Eilbek General Hospital, GERMANY

8:50 a.m. **COMPUTER-ASSISTED TOTAL KNEE ARTHROPLASTY - FIRST EXPERIENCES WITH A CT-BASED AND CT-FREE NAVIGATION SYSTEM**
A. Martin, C. Sukopp, and A. Von Strempel
University of Innsbruck, AUSTRIA

9:00 a.m. **TKR LIMB ALIGNMENT USING IMAGE-FREE AND FLUOROSCOPIC-BASED NAVIGATION**
S.B. Murphy
New England Baptist Hospital, USA

9:10 a.m. **Discussion**

9:30 a.m. **Coffee Break in the Industrial Exhibition**

Session 9 - Spinal Surgery

Session Co-Chairs:
P.S. John, M.S. Orth., D. Orth., *Medical College, INDIA*
Frank Langlotz, Ph.D., *University of Bern, SWITZERLAND*

10:00 a.m. **COMPUTER-ASSISTED FLUOROSCOPIC PLACEMENT OF LUMBAR DISC ARTHROPLASTY: A CADAVERIC STUDY**
Y.R. Rampersaud
University of Toronto, CANADA

10:10 a.m. **NAVIGATED KYPHOPLASTY IN ISO-C^{3D} DATA SETS IN THORACIC AND LUMBAR SPINE FRACTURES, A PROSPECTIVE STUDY**
J. von Recum[1], S. Matschke[1], T. Beutler[2], K. Wendl[1], J. Franke[1], L.P. Nolte[2], A. Wentzensen[1], and P.A. Gruetzner[1]
[1]*University of Heidelberg, GERMANY* and [2]*University of Bern, SWITZERLAND*

10:20 a.m. **A CT-FREE INTRA-OPERATIVE PLANNING AND NAVIGATION SYSTEM FOR MINIMAL-INVASIVE VENTRAL SPONDYLODESIS OF THORACO-LUMBAR FRACTURES**
G. Zheng[1], B. Maier[2], S. Rose[2], I. Marzi[2], B.W. Ebert[1], and L.P. Nolte[1]
[1]*University of Bern, SWITZERLAND* and [2]*Johann Wolfgang Goethe-University, GERMANY*

10:30 a.m. **EVALUATION OF 2D-3D REGISTRATION METHODS FOR IMAGE-GUIDED SURGERY**
E.B. Van de Kraats[1], G.P. Penney[1], D. Tomazevic[2], T. Van Walsum[1], and W.J. Niessen[1]
[1]*University Medical Center Utrecht, THE NETHERLANDS* and [2]*University of Ljubljana, SOLVENIA*

10:40 a.m. **Discussion**

Session 10 - Trauma Applications

Session Co-Chairs:
David Kahler, M.D., *University of Virginia, USA*
Guoyan Zheng, *University of Bern, SWITZERLAND*

10:50 a.m. **THE PLANNING OF FRACTURE TREATMENT USING DIGITAL TEMPLATES**
C. Anderegg and F. Langlotz
University of Bern, SWITZERLAND

11:00 a.m. **THE ROLE OF COMPUTERIZED NAVIGATION IN FIXATING FEMORAL NECK FRACTURES**
D. Ben-David, R. Mosheiff, Y. Weil, A. Peyser, and M. Libergall
Hadassah Hebrew University Medical School, ISRAEL

11:10 a.m. **CLINICAL EVALUATION OF A COMPUTER-ASSISTED SURGICAL PLANNING TOOL DEDICATED TO COMPLEX ARTICULAR FRACTURE REDUCTION**
S. Tarte[1], M. Citak[2], T. Hüfner[2], and F. Langlotz[1]
[1]*University of Bern, SWITZERLAND* and [2]*Hanover Medical School, GERMANY*

11:20 a.m. **Discussion**

Session 11 - New Approaches to Components of CAOS

Session Co-Chairs:
Paul A. Grützner, M.D., *University of Heidelberg, GERMANY*
Russell Taylor, Ph.D., *Johns Hopkins University, USA*

11:30 a.m. **ACCURATE SINGLE X-RAY IMPLANT MEASUREMENTS**
K. Eckman[1], A.B. Mor[2], and B. Jaramaz[2]
[1]*Carnegie Mellon University, USA* and [2]*The Western Pennsylvania Hospital, USA*

11:40 a.m. **ALGORITHMS FOR INTRAOPERATIVE SEGMENTATION OF 3D FLUOROSCOPY DATASETS**
H. Talib, D. Singh, and M. Styner
University of Bern, SWITZERLAND

11:50 a.m. **COMPUTER-ASSISTED SHOULDER HEMIARTHROPLASTY FOR FRACTURES OF THE PROXIMAL HUMERUS: AN IN VITRO COMPARISON WITH TRADITIONAL METHODS**
R.T. Bicknell, J.A. Delude, L.M. Ferreira, C.E. Dunning, G.J.W. King, J.A. Johnson, K.J. Faber, and D. Drosdowech
St. Joseph's Health Centre, CANADA

12:00 p.m. **ANATOMOMETRIC ACL NAVIGATION USING BONE MORPHING: RESULT ON 150 PATIENTS**
S. Plaweski[1], R. Julliard[2], M. Kirchmeier[2], J. Cazal[1], Y. Rossi[1], P. Merloz[1], J. Troccaz[3], and S. Lavallee[4]
[1]*Grenoble North Hospital, FRANCE*, [2]*Clinique Mutualiste Grenoble, FRANCE*, [3]*Grenoble University, FRANCE*, and [4]*Praxim Medivision, FRANCE*

12:10 p.m. **VIRTUAL IMPLANTS DATABASE FOR COMPUTER ASSISTED SURGERY: A NEW SYSTEM TO EFFICIENTLY ACCESS ORTHOPEDIC IMPLANTS FOR PLANNING AND NAVIGATION**
S. Sagbo[1,2], G. Zheng[1], F. Langlotz[1], and L.P. Nolte[1]
[1]*University of Bern, SWITZERLAND and* [2]*Swiss Federal Institute of Technology, SWITZERLAND*

12:20 p.m. **TOWARD THE COST-EFFECTIVE IMPLEMENTATION OF CUSTOMIZED CAOS APPLICATIONS**
G. Douta, O. Nierstrasz, and F. Langlotz
University of Bern, SWITZERLAND

12:30 p.m. **Discussion**

12:45 p.m. **Best Paper and Poster Awards**

1:00 p.m. **Closing Remarks**

SPECIAL POSTERS

Please see page 36 for Special Poster floorplan.

1 **3D NAVIGATION WITH SIREMOBIL ISO-C^{3D} IN FRACTURES OF THE PELVIS**
K. Wendl[1], J. Von Recum[1], T. Beutler[2], U. Langlotz[2], L.P. Nolte[2], A. Wentzensen[1], and P.A. Grützner[1]
[1]*University of Heidelberg, GERMANY* and [2]*University of Bern, SWITZERLAND*

2 **A CT BASED SYSTEM TO CALCULATE RANGE OF MOTION OF THE HIP JOINT AND TO SIMULATE THE FEMOROACETABULAR RESHAPING**
M. Kubiak-Langer, M. Tannast, F. Langlotz, R. Ganz, and K.A. Siebenrock
University of Bern, SWITZERLAND

3 **A FORCE-SENSING DEVICE FOR LIGAMENT BALANCING IN TOTAL KNEE ARTHROPLASTY**
D. Crottet[1,2], T. Maeder[2], D. Fritschy[3], H. Bleuler[2], L.P. Nolte[1], and I.P. Pappas[1]
[1]*University of Bern, SWITZERLAND*, [2]*Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND*, and [3]*Hôpitaux Universitaires de Genève, SWITZERLAND*

4 **A HYBRID CT-FREE NAVIGATION MODULE FOR ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION**
B.W. Ebert, G. Zheng, M. Kunz, and L.P. Nolte
University of Bern, SWITZERLAND

5 **ACCURACY OF FLUOROSCOPIC COMPUTER-ASSISTED PEDICLE SCREW PLACEMENT THROUGH A POSTEROLATERAL FUSION: AN ASSESSMENT OF 20 CONSECUTIVE CASES**
Y.R. Rampersaud[1] and K.S. Lee[2]
[1]*University of Toronto, CANADA* and [2]*General Hospital Jeonju, KOREA*

6 **ACCURATE DETERMINATION OF ACETABULAR COVERAGE WITH CONVENTIONAL RADIOGRAPHY**
M. Tannast[1], G. Zheng[1], C. Anderegg[1], K. Burckhardt[2], F. Langlotz[1], R. Ganz[1], and K.A. Siebenrock[1]
[1]*University of Bern, SWITZERLAND* and [2]*Swiss Federal Institute of Technology, SWITZERLAND*

7 **ANGULAR DEVIATIONS WHILE PINNING A TIBIA CUTTING BLOCK IN TKR**
H. Gramlich[1], H. Dinges[1], and R. Brack[2]
[1]*Westpfalz-Klinikum, GERMANY* and [2]*Intraplant AG, SWITZERLAND*

8 **CLINICAL EVALUATION OF A CT-FREE TOTAL HIP APPLICATION**
L.P. Amiot[1], L. Dorr[2], J. Babisch[3], A. Yun[2], I. Fontaine[4], D. Odermatt[4], and H. Jansen[4]
[1]*Universite de Montreal, CANADA*, [2]*Centinela Hospital Medical Center, USA*, [3]*Friedrich-Schiller-Universität Jena, GERMANY*, and [4]*OrthoSoft Inc, Montreal, CANADA*

9 **DIFFERENCES IN DETERMINING THE CENTER OF THE FEMORAL HEAD WITH AND WITHOUT PELVIC REGISTRATION**
W.M. Mihalko[1], M.J. Phillips[1,2], M. Bayers-Thering[2], and K.A. Krackow[1,2]
[1]*University at Buffalo, USA* and [2]*Buffalo General Hospital, USA*

10 **ENHANCED ANATOMICAL ORIENTATION VIA INTRAOPERATIVE REGISTRATION OF COMPUTED TOMOGRAPHY AND 3D FLUOROSCOPIC DATASETS**
M.S. Blouin[1], P.A. Grützner[2], R. Sharma[1], and M. Styner[1]
[1]*University of Bern, SWITZERLAND* and [2]*University of Heidelberg, GERMANY*

11 **EVALUATION OF METHODS FOR DETERMINING THE CENTER OF THE ANKLE FOR COMPUTER-ASSISTED TOTAL KNEE REPLACEMENT**
R.A. Siston[1], A.C. Daub[1], N.J. Giori[1,2], S.B. Goodman[1], and S.L. Delp[1]
[1]*Stanford University, USA* and [2]*Veteran Affairs Hospital, USA*

12 **EXTENDED CLINICAL APPLICATIONS OF NAVIGATION**
A.C. Gregori and R. Joseph
Hairmyres Hospital, UK

13 **FORCE PREDICTION MODEL FOR ROBOTIC SURGERY IN ORTHOPEDICS**
H.C. Shin and Y.S. Yoon
Korea Advanced Institute of Science and Technology, KOREA

14 **INTERDEPENDENCE OF SLOPE, VARUS/VALGUS, AND ROTATION IN DETERMINING DEPTH OF CUT ERRORS FOR THE DISTAL FEMORAL CUT AND PATELLAR CUT IN TKA SURGERY**
S.B. McCusker and S.D. Stulberg
Northwestern University, USA

15 **INTRAOPERATIVE ISO-C 3D IMAGING - VALUE AND CONSEQUENCES IN 122 CASES**
D. Kendoff[1], J. Geerling[1], M. Citak[1], M. Kfuri, Jr.[2], M. Richter[1], T. Hüfner[1], and C. Krettek[1]
[1]*Hannover Medical School, GERMANY* and [2]*Ribeirao Preto Medical School, BRAZIL*

16 **STEM AND CUP PLACEMENT IN NAVIGATED MINIMALLY INVASIVE TOTAL HIP ARTHROPLASTY - RESULTS OF A CADAVER STUDY**
M. Nogler, F. Rachbauer, E. Mayr, O. Kessler, and M. Krismer
Medical University of Innsbruck, AUSTRIA

17 **PRECISION OF THE RESECTION GUIDES SYSTEMS DURING TOTAL KNEE REPLACEMENT IMPLANTATION**
J.Y. Jenny and C. Boeri
Center for Orthopaedic and Trauma Surgery, FRANCE

18 **ROTATIONAL MOVEMENT OF AN OSTEOARTHRITIC KNEE DURING FLEXION**
J.Y. Jenny and C. Boeri
Center for Orthopaedic and Trauma Surgery, FRANCE

19 **STUDY ON A DEVELOPMENT OF MIS ROBOT FOR THA**
S.H. Park, Y.S. Yoon, D.S. Kwon, and J.J. Lee
Korea Advanced Institute of Science and Technology, KOREA

POSTER CONTRIBUTIONS

Please see page 37 for the Poster Contributions floorplan.

Accuracy

20 **A NEW MINI-INVASIVE METHOD TO LOCATE THE CENTER OF THE HIP IN TOTAL KNEE ARTHROPLASTY USING COMPUTER ASSISTED SURGERY**
F. Picard[1], F. Leitner[2,4], V. Chevalier[2], P. Martin[3], F.P. Firmback[2,4], and D. Saragaglia[5]
[1]*Ecole Central Paris, FRANCE*, [2]*B. Braun, FRANCE*, [3]*Ecole des Mines, FRANCE*, [4]*B. Braun, GERMANY*, and [5]*Grenoble University, FRANCE*

21 **EXPERIMENTAL EVALUATION OF A FLUOROSCOPY-GUIDED AUTOMATIC NAVIGATION SYSTEM FOR DISTAL LOCKING OF INTRAMEDULLARY NAILS**
L. Sun[1], L. Hu[2], J.Q. Wang[1], W.Y. Liu[2], L.D. Zhang[1], T.M. Wang[1], and M.Y. Wang[1]
[1]*Jishuitan Hospital, CHINA* and [2]*Beijing University of Aeronautics and Astronautics, CHINA*

22 **NAVIGATED ISO-C 3D BASED PERCUTAN OSTEOID OSTEOMA RESECTION -PRELIMINARY CLINICAL REPORT**
D. Kendoff[1], J. Geerling[1], L. Bastian[1], M. Citak[1], M. Kfuri, Jr.[2], E. Mössinger[1], C. Krettek[1], and T. Hüfner[1]
[1]*Hannover Medical School, GERMANY* and [2]*Ribeirao Preto Medical School, BRAZIL*

23 **NAVIGATED NON IMAGE BASED REGISTRATION OF THE POSITION OF THE PELVIS DURING TOTAL HIP REPLACEMENT - AN ACCURACY AND REPRODUCIBILITY STUDY**
J.Y. Jenny and C. Boeri
Center for Orthopaedic and Trauma Surgery, FRANCE

Education

24 **A NOVEL FLUOROSCOPY-GUIDED AUTO-FRAME NAVIGATION SYSTEM FOR DISTAL LOCKING OF INTRAMEDULLARY NAILS**
W.Y. Liu[1], L. Hu[1], T.M. Wang[1], J.Q. Wang[2], L. Sun[2], L.D. Zhang[2], Y.T. Zhao[1], and M.Y. Wang[2]
[1]*Beijing University of Aeronautics and Astronautics, CHINA* and [2]*Jishuitan Hospital, CHINA*

25 **MINI INVASIVE COMPUTER ASSISTED BI-UNICOMPARTIMENTAL KNEE REPLACEMENT**
N. Confalonieri and A. Manzotti
Istituti Clinici di Perfezionamento., ITALY

POSTER CONTRIBUTIONS

Knee Surgery

26 **A NEW APPROACH FOR COMPUTER-AIDED LONG BONE FRACTURE REDUCTION USING UNILATERAL EXTERNAL FIXATOR**
T.K.K. Koo[1,2], B.T.L. Leong[2], E.Y.S. Chao[2], and A.F.T. Mak[1]
[1]*Hong Kong Polytechnic University, HONG KONG* and [2]*Johns Hopkins University, USA*

27 **A NEW APPROACH FOR PLANNING SURFACE REPLACEMENT PROSTHESIS SURGERY ON THE HIP**
E. Schkommodau[1], M. de la Fuente[1], S. Froebe[1], D.C. Wirtz[2], F. Portheine[3], and K. Radermacher[1]
[1]*Aachen University, GERMANY*, [2]*University Hospital Aachen, GERMANY*, and [3]*Surgitaix AG, GERMANY*

28 **ACCURACY OF COMPUTER TOMOGRAPHY-BASED NAVIGATION SYSTEM FOR TOTAL KNEE ARTHROPLASTY**
S. Matsuda, R. Nabeyama, H. Miura, H. Mizuuchi, K. Okazaki, and Y. Iwamoto
Kyushu University, JAPAN

29 **ACCURACY OF FREEHAND CUTTING IN SIMULATED TOTAL KNEE SURGERY**
K. Iesaka[1], P.S. Walker[1], D.E. Kim[2], Y.G. Patel[3], R.E. Forman[1], and C.-S. Wei[2]
[1]*New York University Medical Center, USA*,
[2]*Cooper Union for the Advancement of Science and Art, USA*, and [3]*Columbia University, USA*

30 **ADVANTAGES IN NAVIGATION IN TOTAL KNEE REPLACEMENT AFTER HIGH TIBIAL OSTEOTOMY**
R. Zini, G. Ponzetto, and P. Pirani
A.O. San Salvatore-Pesaro, ITALY

31 **AN IN VIVO RSA STUDY ON THE POLYETHYLENE MOBILITY OF A MOBILE BEARING TKR**
M. Marcacci, A. Russo, L. Montagna, L. Bragonzoni, M.L. Zampagni, and A. Visani
Istituti Orthopedici Rizzoli, ITALY

32 **CLINICAL RESULTS OF INTRAOPERATIVE 3-D IMAGING AT TIBIAL PLATEAU FRACTURES**
D. Kendoff, M. Citak, J. Geerling, T. Gösling, C. Krettek, and T. Hüfner
Hannover Medical School, GERMANY

33 **CLINICAL VALIDATION OF A NOVEL SPRING LOADED TENSIONING DEVICE AND COMPUTER ASSISTED NAVIGATION**
S. Bignozzi[1], J.L. Briard[2], M. Marcacci[1], and M. Swank[3]
[1]*Istituti Ortopedici Rizzoli, ITALY*, [2]*Centre Medico-Chirurgical Du Cedre, FRANCE*, and
[3]*Cincinnati Orthopaedic Research Institute, USA*

34 **COMPUTER-ASSISTED FREEHAND NAVIGATION FOR TKR**
R.E. Forman[1], P.S. Walker[1], C.-S. Wei[2], H. Haider[3], M.A. Balicki[2], and G. Aggarwal[4]
[1]*New York University Medical Center, USA*,
[2]*Cooper Union for the Advancement of Science and Art, USA,*
[3]*University of Nebraska Medical Center, USA,* and [4]*City College, USA*

35 **COMPUTER ASSISTED PATELLOFEMORAL REPLACEMENT; A MECHANISM FOR OPTIMISING ROTATION**
A.J. Cossey and A.J. Spriggins
Sportsmed SA Hospital, AUSTRALIA

36 **COMPUTERIZED NAVIGATION FOR CLOSED REDUCTION DURING FEMORAL INTRAMEDULLARY NAILING**
R. Mosheiff, Y. Weil, E. Peleg, and M. Liebergall
Hadassah University Medical School, ISRAEL

37 **CT-BASED COMPUTER-ASSISTED KNEE ARTHROPLASTY: COMPARISON WITH THE CONVENTIONAL PROCEDURE (PRELIMINARY STUDY)**
R.W.W. Hsu and C.-H. Chen
Chang Gung Memorial Hospital, TAIWAN

38 **CT-BASED, NAVIGATION-ASSISTED PEDICLE SCREW INSERTION IN THORACIC AND LUMBAR SPINE FRACTURES**
T.T. Tsai, W.J. Chen, L.H. Chen, C.C. Niu, T.S. Fu, P.L. Lai, S.W. Yu, and C.W. Yu
Chang Gung Memorial Hospital, TAIWAN

39 **CT-FREE COMPUTER-ASSISTED KNEE ARTHROPLASTY: A PRELIMINARY STUDY**
R.W.W. Hsu and C.-H. Chen
Chang Gung Memorial Hospital, TAIWAN

40 **CT-FREE HIP NAVIGATION SYSTEM USING COMPENSATION METHOD WITH C-ARM IMAGE**
B.H. Ko[1], Y.S. Yoon[1], and C.H. Won[2]
[1]*Korea Advanced Institute of Science and Technology, KOREA* and [2]*SU Orthopaedic Surgery Hospital, KOREA*

41 **DETECTION OF THE FUNCTIONAL KNEE CENTER USING THE MEAN HELICAL AXIS: APPLICATION IN HTO**
E. Stindel[1,3], J.D. Gyl[1,2], G. Guillard[1,2], C. Hamitouche[1,2], and C. Roux[1,2]
[1]*INSERM, FRANCE*, [2]*Ecole Nationale Supérieure de Télécommunications de Bretagne, FRANCE*, and
[3]*Universitaire de Brest, FRANCE*

42 **FIRST CLINICAL EXPERIENCES IN STEM NAVIGATION WITH THE SURGIGATE SYSTEM**
K. Wendl[1], J. von Recum[1], G. Zheng[2], U. Langlotz[2], L.P. Nolte[2], A. Wentzensen[1], and P.A. Grützner[1]
[1]*University of Heidelberg, GERMANY* and [2]*University of Bern, SWITZERLAND*

43 **INFLUENCE OF LOCATOR GEOMETRY AND BLOOD STAINS ON CAOS ACCURACY**
J. Stifter[1], P. Ritschl[2], H. Broers[3], and C. Calame[1]
[1]*PI Precision Implants AG, SWITZERLAND*, [2]*Orthopaedic Hospital Gersthof, AUSTRIA*, and
[3]*Axios 3D Services GmbH, GERMANY*

44 **INSTITUTING TKA NAVIGATION IN A COMMUNITY SETTING**
B.N. Stulberg, L. Keppler, R. Kirby
Cleveland Orthopaedic and Spine Hospital, USA

45 **NAVIGATION ASSISTED TWO INCISION MINIMALLY INVASIVE TOTAL HIP ARTHROPLASTY, PRELIMINARY RESULTS**
Y. Weil, Y. Mattan, A. Kandel, and M. Liebergall
Hadassah University Medical Hospital, ISRAEL

46 **NAVIGATION IN TOTAL HIP ARTHROPLASTY**
R.W.W. Hsu, K.-T. Peng, and C.-H. Chen
Chang Gung Memorial Hospital, TAIWAN

47 **PROCEDURES FOR THE INTEGRATION OF HETEROGENEOUS DEVICES IN CAOS SYSTEMS**
R. Torres, J.A. Fuentes, E. Gómez, A. Molina, and F.J. Reyero
Polytechnic University of Cartagena, SPAIN

48 **PROSPECTIVE RANDOMISED CT-SCAN STUDY: TRADITIONAL VS COMPUTER ASSISTED TOTAL KNEE ARTHROPLASTY**
G. Gasparini, P. Belli, M. Vasso, and L. Tafuro
Catholic University, ITALY

49 **RESULTS OF THE BRAINLAB CT-FREE NAVIGATION SYSTEM IN TOTAL KNEE ARTHROPLASTY: COMPARISON WITH THE CONVENTIONAL PROCEDURE**
R.W.W. Hsu and C.-H. Chen
Chang Gung Memorial Hospital, TAIWAN

50 **SOFT TISSUE TREATMENT IN TKA WITH A MODERN NAVIGATION SYSTEM AND A FLOATING PLATFORM KNEE-SYSTEM. EXPERIENCE AND PITFALLS IN 250 CASES**
U. Clemens, R. Geyer, and R.K. Miehlke
St. Josef Stift, GERMANY

51 **THE ACCURACY IN LOWER EXTREMITY ALIGNMENT OF TOTAL KNEE ARTHROPLASTY USING COMPUTER-ASSISTED NAVIGATION SYSTEM**
E.K. Song, S.M. Rowe, E.S. Moon, T.R. Yoon, and J.K. Seon
Chonnam National University Hospital, KOREA

52 **THE USE OF COMPUTERIZED NAVIGATION IN THE TREATMENT OF GUNSHOT AND SHRAPNEL INJURY**
Y. Weil, M. Liebergall, E. Peleg, and R. Mosheiff
Hadassah University Medical Hospital, ISRAEL

53 **THIRD GENERATION OF ALGORITHM FOR THE KINEMATIC DETERMINATION OF THE HIP-JOINT CENTER FOR ORTHOPEDIC NAVIGATION**
H. Broers[1] and P. Ritschl[2]
[1]*AXIOS 3D Services, GERMANY* and [2]*Orthopaedic Hospital Gersthof, AUSTRIA*

54 **TOTAL HIP ARTHROPLASTY USING CT-BASED HIP NAVIGATION FOR JAPANESE DYSPLASTIC HIP JOINTS**
K. Tokunaga, M. Ito, H. Kitahara, T. Ito, R. Takano, E. Endo, and N. Endo
Niigata University, JAPAN

55 **UPDATE ON THE SECOND ROBODOC MULTI CENTER TRIAL**
W.L. Bargar
Sutter Joint Replacement Center, USA

56 **VALIDATION OF ROBOTICALLY-ASSISTED SYSTEM FOR SPINAL PROCEDURES**
A. Natanzon[1], A. Vitchevsky[1], B. Silberstein[2], E. Batkilin[3], M. Burman[3], and M. Shoham[4]
[1]*ANAV Software Solutions, ISRAEL*, [2]*Carmel Hospital, ISRAEL*,
[3]*Mazor Surgical Technologies, ISRAEL*, and [4]*Technion, ISRAEL*

New Components of CAOS

57 **A CUTTING GUIDE POSITIONER ROBOT TO IMPROVE BONE-CUTTING PRECISION IN KNEE OSTEOTOMY**
B. Nahum[1], L. Blondel[1], E. Tassel[1], E. Dombre[2], P. Poignet[2], P. Maillet[1,2], and P. Maury[3]
[1]*Medtech S.A., FRANCE*, [2]*Montpellier Laboratory of Computer Science, Robotics and Microelectronics, FRANCE*, and [3]*Montpellier University Hospital, FRANCE*

58 **A NEW FUNCTIONAL DETERMINATION OF THE HIP JOINT CENTER FOR COMPUTER-ASSISTED TOTAL KNEE REPLACEMENT**
R.A. Siston and S.L. Delp
Stanford University, USA

59 **A VALIDATION PROTOCOL TO REPRODUCIBLY ASSESS ACCURACY OF BOTH NAVIGATION AND MOTORIZED COMPUTER AIDED CUTTING GUIDE POSITIONER**
L.C. Orlandini, M. Bernardoni, F. Balzarini, and D. Kalas
Medacta International SA, SWITZERLAND

60 **ANALYSIS OF THE COXOFEMORAL JOINT STABILITY DURING A SEQUENTIAL SECTION OF SOFT TISSUES WITH THE HELP OF THE HIPLOGICS® NAVIGATION SYSTEM**
R. Gérard[1], E. Stindel[1,2], and C. Lefevre[1,2]
[1]*INSERM, FRANCE* and [2]*Universitaire de Brest, FRANCE*

61 **CAS COMPARISON OF TWO DOUBLE-BUNDLE TECHNIQUES FOR ACL RECONSTRUCTION**
S. Zaffagnini, S. Martelli, M. Bontempi, and S. Bignozzi
Istituti Ortopedici Rizzoli, ITALY

62 **COMPUTERIZED KINEMATIC ANALYSIS OF ROTATOR CUFF BEHAVIOUR DURING PASSIVE MOTION**
S. Martelli[1], S. Zaffagnini[1], R. Minola[2], P. Golano[3], and D. Giovannuci[1]
[1]*Rizzoli Orthopaedic Institute, ITALY*, [2]*University of Milano, ITALY*, and [3]*Institute of Anatomy, SPAIN*

63 **CT-BASED-EVALUATION OF THE 3-DIMENSINAL CUP POSITION AFTER NAVIGATION-ASSISTED THA**
M. Ito, K. Tokunaga, H. Kitahara, T. Ito, E. Endo, R. Takano, and N. Endo
Niigata University, JAPAN

64 **NAVIGATION AND LOWER LIMB FRACTURES: ADVANTAGES AND SIGNIFICANCE**
N. Fredella, M. Manili, A. Vitullo, and R. Sgrambiglia
San Pietro Fatebenefratelli Hospital, ITALY

65 **NAVIGATION THROUGH ORTHOPILOT IN TOTAL KNEE PROSTHESIS: ADVANTAGES AND SIGNIFICANCE**
M. Manili and N. Fredella
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[1]*Kliniken Dr. Erler GmbH, GERMANY* and [2]*Berufsgenossenschaftliche Unfallklinik Frankfurt am Main, GERMANY*

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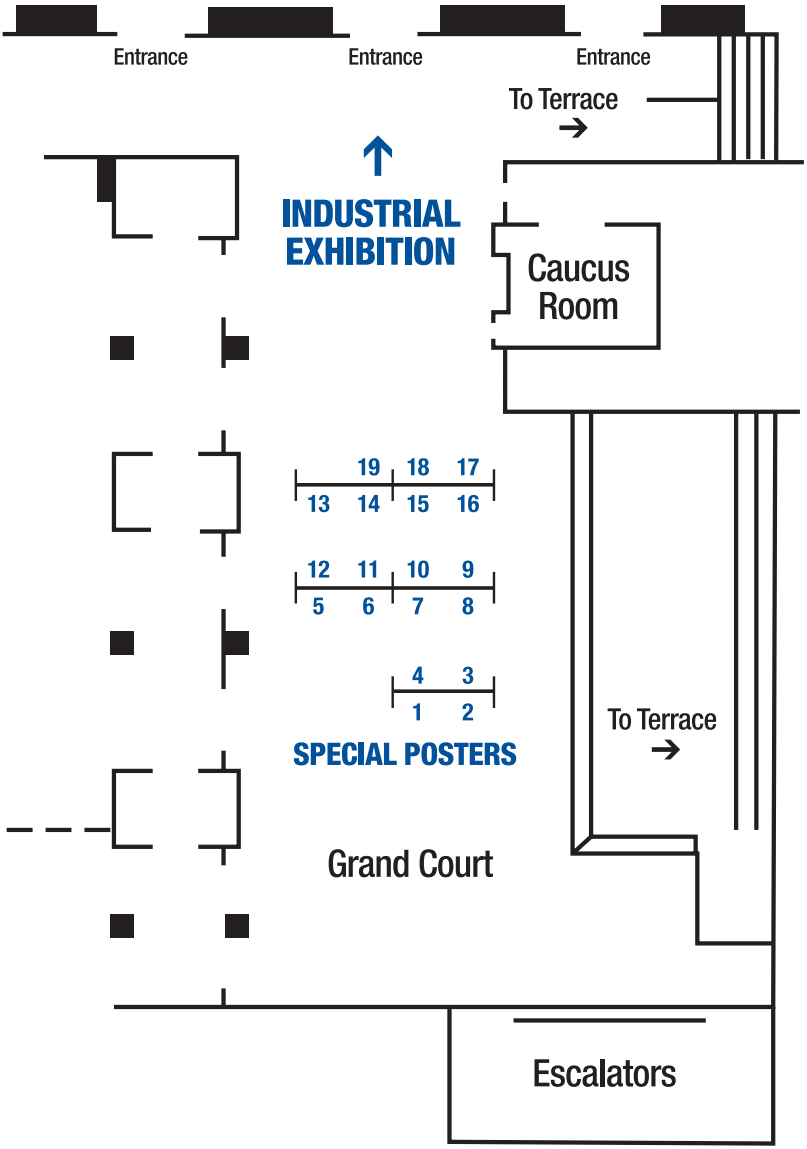

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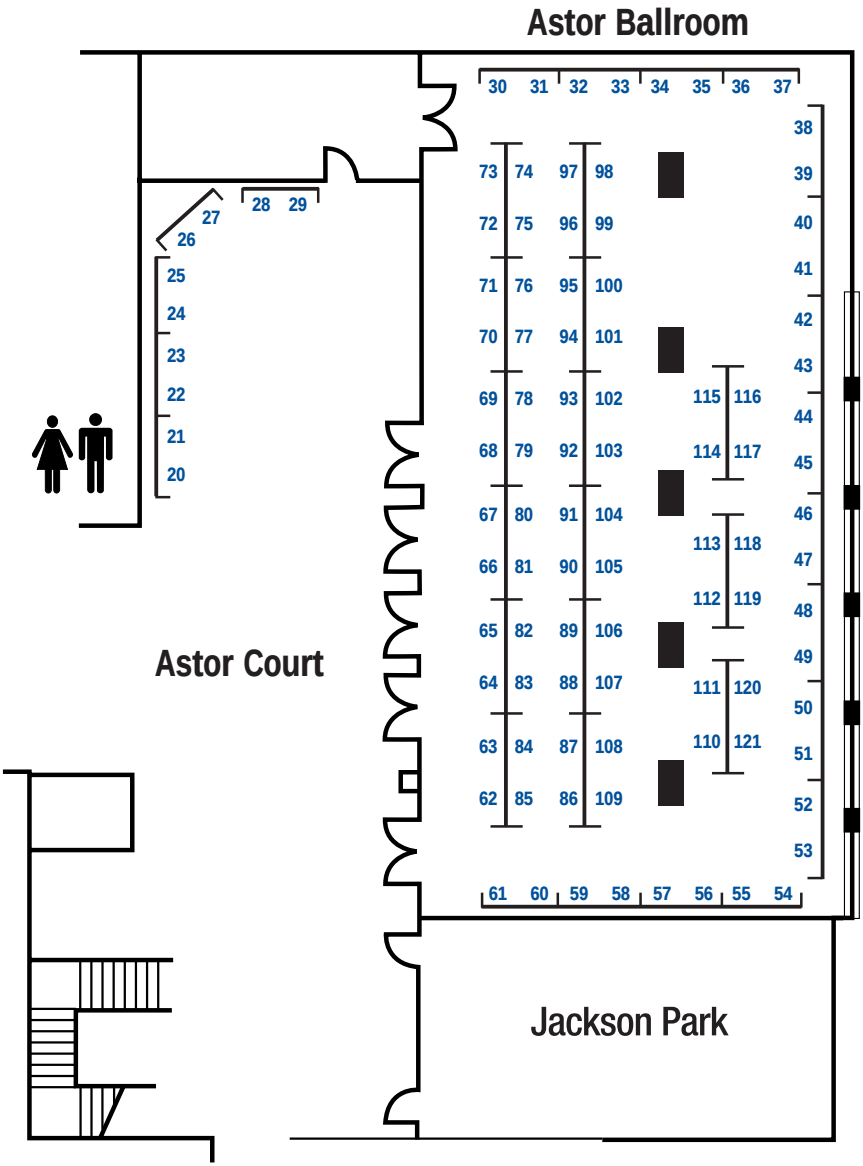

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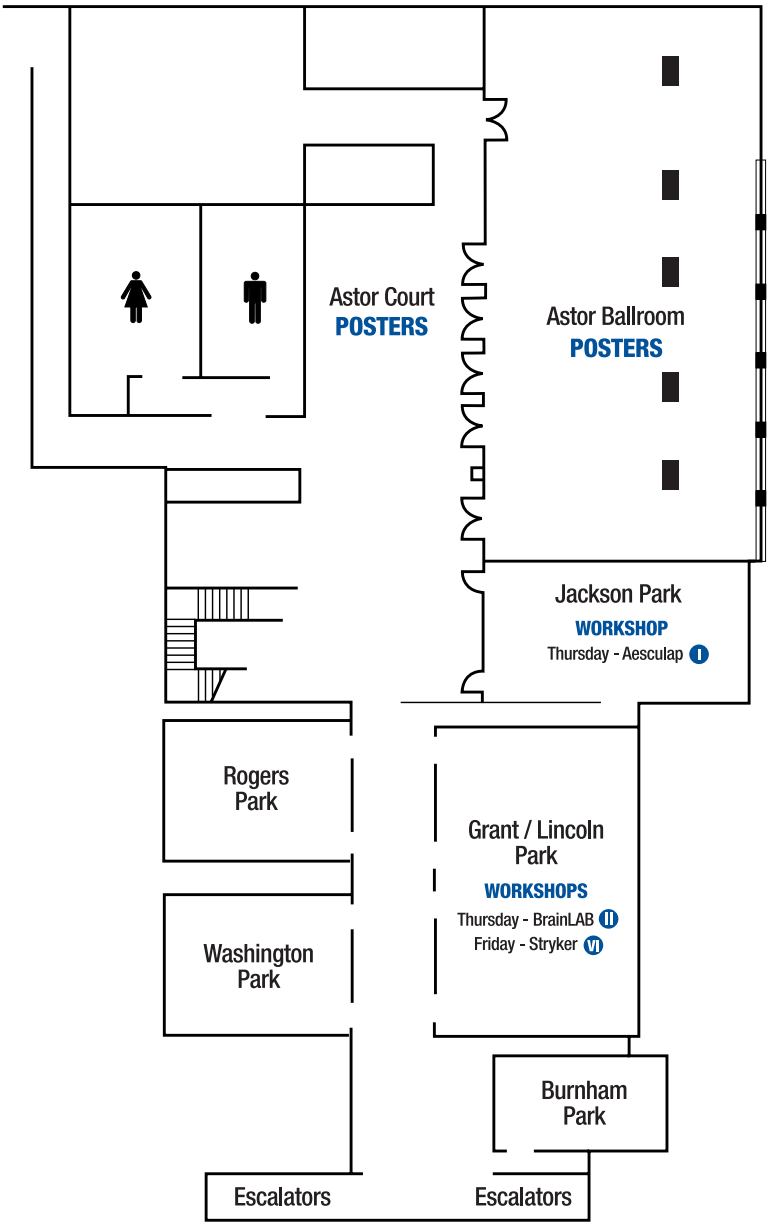

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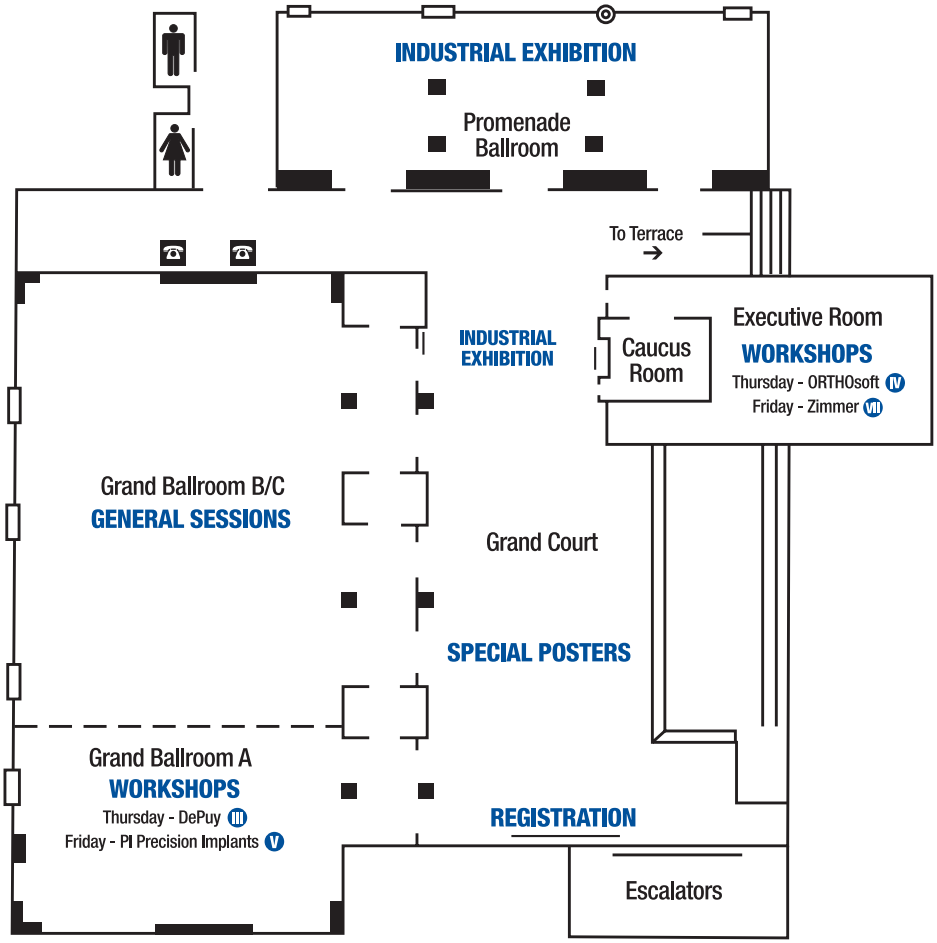

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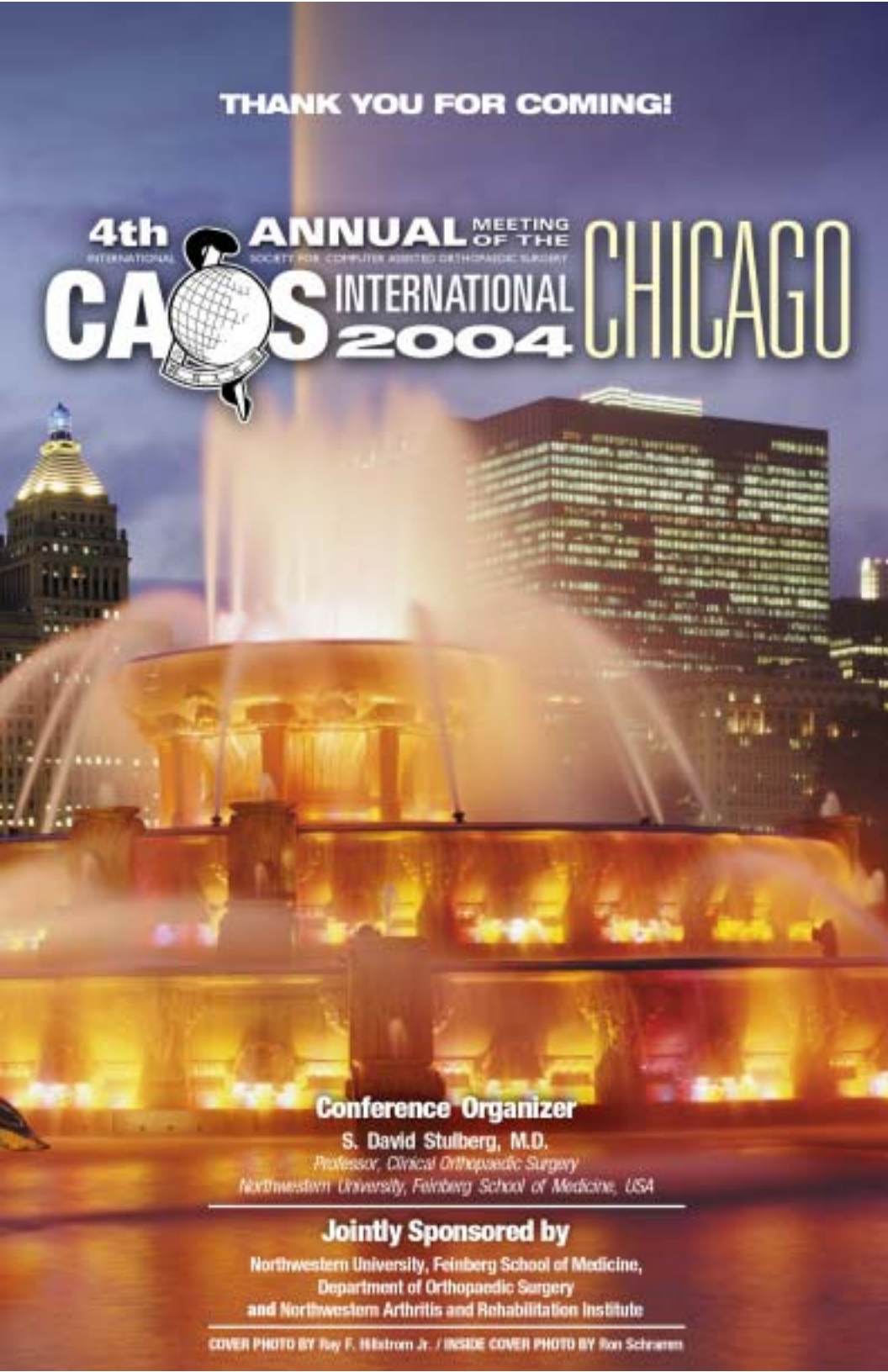

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GERMANY
Tel.: +49 (77 32) 939 19 00
Email: info@ndieurope.com
Website: www.ndieurope.com

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HONG KONG
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