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F. E. Milano, Univ. de Buenos Aires (Argentina) and Hospital Italiano de Buenos Aires (Argentina); L. E. Ritacco, G. L. Farfalli, L. A. Aponte-Tinao, F. González Bernaldo de Quirós, Hospital Italiano de Buenos Aires (Argentina); M. Risk, Instituto Tecnológico de Buenos Aires (Argentina) and Consejo Nacional de Investigaciones Científicas y Tecnicas (Argentina)

8316 2G Two new ad-hoc models of detection physics and their evaluation for navigated beta probe surface imaging [8316-88]
D. I. Shakir, A. Hartl, F. R. Schneider, J. Pulko, S. I. Ziegler, N. Navab, T. Lasser, Technische Univ. München (Germany)

8316 2H Freehand SPECT reconstructions using look up tables [8316-89]
A. Hartl, D. I. Shakir, R. Kojchev, N. Navab, S. I. Ziegler, T. Lasser, Technische Univ. München (Germany)

POSTER SESSION: TECHNOLOGY EVALUATION

8316 2I Lightweight distributed computing for intraoperative real-time image guidance [8316-90]
S. Suwelack, D. Katic, S. Wagner, P. Spengler, S. Bodenstedt, S. Röhl, R. Dillmann, S. Speidel, Karlsruhe Institute of Technology (Germany)

8316 2J Simplified development of image-guided therapy software with MITK-IGT [8316-91]
A. M. Franz, A. Seitel, German Cancer Research Ctr. (Germany); M. Servatius, Univ. of Heidelberg (Germany); C. Zöllmer, I. Gergel, I. Wegner, J. Neuhaus, S. Zelzer, M. Nolden, J. Gaa, P. Mercea, K. Yung, German Cancer Research Ctr. (Germany); C. M. Sommer, B. A. Radeleff, Univ. of Heidelberg (Germany); H.-P. Schlemmer, German Cancer Research Ctr. (Germany); H.-U. Kauczor, Univ. of Heidelberg (Germany); H.-P. Meinzer, L. Maier-Hein, German Cancer Research Ctr. (Germany)

8316 2K Simulation, design, and analysis for magnetic anchoring and guidance of instruments for minimally invasive surgery [8316-92]
H. Luo, Children's National Medical Ctr. (United States) and Tianjin Univ. (China); E. Wilson, K. Cleary, Children's National Medical Ctr. (United States)

8316 2L A robust motion estimation system for minimal invasive laparoscopy [8316-93]
J. M. Marcinczak, U. von Öhsen, R.-R. Grigat, Technische Univ. Hamburg-Harburg (Germany)

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8316 2M Imaging of prostate cancer: a platform for 3D co-registration of in-vivo MRI ex-vivo MRI and pathology [8316-95]
C. Orczyk, Univ. Hospital of Caen (France) and New York Univ. Medical Ctr. (United States); A. Mikheev, A. Rosenkrantz, J. Melamed, S. S. Taneja, H. Rusinek, New York Univ. Medical Ctr. (United States)
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3D prostate segmentation of ultrasound images combining longitudinal image registration and machine learning [8316-97]
X. Yang, Emory Univ. (United States); B. Fei, Emory Univ. (United States) and Georgia Institute of Technology (United States)

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C. A. Linte, M. E. Reitmam, Mayo Clinic (United States); B. Dilger, The Univ. of Iowa (United States); M. S. Gunawan, Georgetown Univ. Medical Ctr. (United States); S. P. Arunachalam, D. R. Holmes III, D. L. Packer, R. A. Robb, Mayo Clinic (United States)

Evaluation of mitral valve replacement anchoring in a phantom [8316-99]
A. J. McLeod, J. Moore, P. Lang, D. Bainbridge, The Univ. of Western Ontario (Canada); G. Campbell, The Univ. of Western Ontario (Canada) and National Research Council of Canada (Canada); D. L. Jones, G. M. Guiraudon, T. M. Peters, The Univ. of Western Ontario (Canada)

Cryo-balloon catheter position planning using AFI T [8316-100]
A. Kleinoeder, A. Brost, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); F. Bourier, Klinik fur Herzrhythmusstorungen, Krankenhaus Barmherzige Bruder (Germany); M. Koch, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); K. Kurzidim, Klinik fur Herzrhythmusstorungen, Krankenhaus Barmherzige Bruder (Germany); J. Horneger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and School in Advanced Optical Technologies (Germany); N. Strobel, Siemens AG (Germany)

Simulation based patient-specific optimal catheter selection for right coronary angiography [8316-101]
S. Rahman, C. Thoene, S. Wesarg, Technische Univ. Darmstadt (Germany); W. Voelker, Universitaetsklinikum Wuerzburg (Germany)

Automatic contour and centerline extractions of single and bifurcated vessels in coronary angiogram [8316-102]
J. Baek, H. Hong, Seoul Women’s Univ. (Korea, Republic of)

Robust tracking of a virtual electrode on a coronary sinus catheter for atrial fibrillation ablation procedures [8316-103]
W. Wu, T. Chen, Siemens Corporate Research (United States); N. Strobel, Siemens AG (Germany); D. Comaniciu, Siemens Corporate Research (United States)
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I. Cheng, Univ. of Alberta (Canada) and Institut National des Sciences Appliquées (France); A. Firouzmandesh, Univ. of Alberta (Canada); A. Leleve, Institut National des Sciences Appliquées (France); R. Shen, Univ. of Alberta (Canada); R. Moreau, V. Brizzi, M.-T. Pham, T. Redarce, P. Lermusiaux, Institut National des Sciences Appliquées (France); A. Basu, Univ. of Alberta (Canada)

8316 2X Feature identification for image-guided transcatheter aortic valve implantation (Cum Laude Poster Award) [8316-106]
P. Lang, M. Rajchl, A. J. McLeod, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); M. W. Chu, The Univ. of Western Ontario (Canada); T. M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)

8316 2Y Towards image-guided atrial septal defect repair: an ex vivo analysis [8316-107]
D. M. Kwartowitz, Clemson Univ. (United States) and Medical Univ. of South Carolina (United States); F. N. Mefleh, Medical Univ. of South Carolina (United States); G. H. Baker, Clemson Univ. (United States) and Medical Univ. of South Carolina (United States)

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8316 2Z Optimizing the delivery of deep brain stimulation using electrophysiological atlases and an inverse modeling approach [8316-108]
K. Sun, S. Pallavaram, W. Rodriguez, P.-F. D’Haese, B. M. Dawant, M. I. Miga, Vanderbilt Univ. (United States)

8316 30 Visualizing the path of blood flow in static vessel images for image guided surgery of cerebral arteriovenous malformations [8316-109]
S. J.-S. Chen, M. Kersten-Oertel, S. Drouin, D. L. Collins, McGill Univ. (Canada)

8316 31 Intraoperative brain tumor resection cavity characterization with conoscopic holo-graphy [8316-110]
A. L. Simpson, J. Burgner, I. Chen, T. S. Pheiffer, K. Sun, R. C. Thompson, R. J. Webster III, M. I. Miga, Vanderbilt Univ. (United States)

8316 32 Analysis of electrodes’ placement and deformation in deep brain stimulation from medical images [8316-111]
M. Mehri, F. Lalys, C. Maumet, INSERM (France) and IRISA, CNRS, Univ. de Rennes 1 (France); C. Haegelen, INSERM (France), IRISA, CNRS, Univ. de Rennes 1 (France), and Pontchaillou Univ. Hospital (France); P. Jannin, INSERM (France) and IRISA, CNRS, Univ. de Rennes 1 (France)
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K. Lu, Philips Research North America (United States); S. Xu, National Institutes of Health (United States); Z. Xue, S. T. Wong, Methodist Hospital Research Institute (United States)

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Real-time motion compensation for EM bronchoscope tracking with smooth output - ex-vivo validation [8316-119]
T. Reichl, Technische Univ. München (Germany); I. Gergel, German Cancer Research Ctr. (Germany); M. Menzel, H. Hautmann, Klinikum rechts der Isar (Germany); I. Wegner, H.-P. Meinzner, German Cancer Research Ctr. (Germany); N. Navab, Technische Univ. München (Germany)

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X. Luo, Nagoya Univ. (Japan); T. Kitasaka, Aichi Institute of Technology (Japan); K. Mori, Nagoya Univ. (Japan)

Utilizing ultrasound as a surface digitization tool in image guided liver surgery [8316-122]
K. E. Miller, J. E. Ondrake, T. S. Pheiffer, A. L. Simpson, Vanderbilt Univ. (United States); M. I. Miga, Vanderbilt Univ. (United States) and Vanderbilt Univ. Medical Ctr. (United States)

Automatic alignment of pre- and post-interventional liver CT images for assessment of radiofrequency ablation [8316-123]
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1 Visualization, Segmentation, and Registration
   Jayaram K. Udupa, The University of Pennsylvania Health System (United States)
   Pierre Jannin, Université de Rennes 1 (France)

2 Tracking and Radiation Therapy
   Gabor Fichtinger, Queen’s University (Canada)
   Jay B. West, Accuray, Inc. (United States)

3 Keynote and Robotics
   David R. Holmes III, Mayo Clinic (United States)
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4 Simulation and Modeling
   Michael Miga, Vanderbilt University (United States)
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5 2D/3D and Fluoroscopy
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Introduction

Welcome to the 2012 edition of the SPIE Image-Guided Procedures, Robotic Interventions, and Modeling conference proceedings. This year, we changed the title of the conference to emphasize the growing importance of robotics. The conference continues to be a premier venue for our field, small enough to be highly collegial yet still showcasing the latest technical advances. The conference is an ideal setting for students to gain an understanding of the research community and interact with both peers and mentors. This year we received approximately 140 abstract submissions and accepted approximately 120. The number and quality of submissions has remained strong despite many changes in the research and funding environment, which is very encouraging for our field.

Reflecting the new emphasis area of robotics, our conference was fortunate this year to welcome Dr. Russ Taylor of Johns Hopkins University as our keynote speaker. Dr. Taylor’s presentation was a grand tour through the use of robotics in medical applications, emphasizing the capacity of tools both simple and complex to enhance and extend the physician’s individual capabilities. Yet his talk was also a bold look to a future vision where the entire operating suite is considered as a unified system. Within that vision, pervasive data collection throughout the operating “process” can be used for continual optimization, similar to what is done in traditional industrial and systems engineering.

This year we continued the tradition of holding a combined session with the Ultrasonic Imaging, Tomography, and Therapy conference. There are numerous scientific areas where our two conferences overlap, and thus the joint session is an excellent opportunity for the two groups to learn from each other and from the keynote speaker. Dr. Keith Paulsen of Dartmouth Medical School gave the Ultrasonics keynote, and discussed the many developments in 3D ultrasound and how they have benefited modern neurosurgery by enabling more robust registrations and improved intraoperative image updates.

This year we bade farewell to three of our “retiring” committee members: Jay Udupa, Bob Galloway, and Kevin Cleary. These three have given many dedicated years of service to growing this conference and have been great mentors to those of us who are new to the committee. We are truly grateful to all our committee members for their help in reviewing abstracts, evaluating student papers, and judging posters. We can always rely on their speedy and conscientious advice. Their steadfast dedication to the work of the committee makes our job much more pleasant.
It would be impossible to run this conference without the outstanding support of the SPIE staff members, including the office staff, management, and editors. They make our job easier, ensure that deadlines are met, and allow us to focus on the technical content. Particular thanks go to Sandy Hoelterhoff and Diane Cline for always being on top of every detail.

Finally, we would like to thank all the attendees who come to give talks, present posters, and actively participate in the meeting. We look forward to seeing you next year in Orlando and for many years to come!

David R. Holmes III
Kenneth H. Wong
Fortieth Anniversary of SPIE Medical Imaging Meeting

Robert M. Nishikawa*
Carl J. Vyborny Translation Laboratory for Breast Imaging Research
Department of Radiology, and the Committee on Medical Physics, The University of Chicago, 5841
S. Maryland Ave. MC-2026, Chicago, IL 60637

This meeting marked the 40th year from the first SPIE Medical Imaging meeting. This paper presents a brief summary of
the 40-year history of the meeting, with an emphasis on the Physics Conference. That is, when the meeting split into
multiple conferences, data are presented mostly for the Physics conference only.

The first conference was held in 1972 in Chicago and it was called: Application of Optical Instrumentation in Medicine.

“We have endeavored, by way of the seminar, to provide a communication link between those with
expertise in the various technologies associated with image forming devices and those in the medical
field who rely on the fruits of these technologies for many of their diagnostic tools...there is a genuine
interest among those in the medical field for a better understanding of the fundamental technology of
imaging systems.” William C. Zarnstroff, General Chairman

For the next 40 years, with the exception of 1978 the meeting was held annually.

The first 13 conferences were entitled: Application of Optical Instrumentation in Medicine, appended with a roman
numeral. The 14th meeting (1986) was modified to recognize the growing importance of PACS to the meeting:
Application of Optical Instrumentation in Medicine XIV and Picture Archiving and Communication Systems (PACS IV)
for Medical Applications. The following year, the conference name changed to “Medical Imaging” as it is known today,
although the first 6 were denoted by roman numerals. Starting in 1993, the year was appended to the title.

The meeting started as a single track, two-day conference, and now has 8 distinct conferences covering five days plus an
additional day of courses.

In 1988, the proceedings were published in two volumes, 914A and 914B. The former covering physics, image
processing, and perception and the latter display and PACS. The following year (1989) each of those two split in two so
that there were now four conferences:

1. Medical Imaging III: Image Formation
2. Medical Imaging III: Image Capture and Display
3. Medical Imaging III: Image Processing
4. Medical Imaging III: PACS System Design and Evaluation

These sessions were partially overlapping and, thus, for the first time, the meeting had parallel session.

This configuration of conferences remained until 1994 when Image Perception and Physiology and Function from
Multidimensional Images were added. In 1997, Ultrasonic Transducer Engineering was added. In 2007, Computer-
Aided Diagnosis was added.

From 1976 to 1983, the meeting was held in conjunction with or preceding the American Roentgen Ray Society. As a
result, the location of the meeting changed annually. Starting in 1985, the meeting was held in Newport Beach, CA, and
this was home for the next 10 years, except in 1991, the meeting was held in San Jose in conjunction with the Electronic
Imaging meeting. In 1995, the meeting was then moved to San Diego, and then returned once more to Newport Beach,
before moving to San Diego till 2009. Since 2009 the meeting has been alternating between San Diego and Lake Buena
Vista, FL.

In the Introduction to the proceedings in 1984, Chairman Roger Schneider wrote:

This meeting, the twelfth in the series ... was intended to be a change in direction from recent meetings
in the series, a reversion to the attack on fundamental problems in imaging which earlier meetings
represented. We also desired to bring onto the floor a recognition that the scientific interest in imaging

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is more broad and active now than it was a decade ago and that substantial progress has been made in formulating at least the structure of an understanding of the conveyance of information to human observers through imaging channels. ... We recognized the current intense interest in development of medical systems based upon the most contemporary image communication and storage technologies, and included that topic. The design goal was to address the physics and statistics of image encoding by modality; and the processing, display, archiving, management, and psychophysical considerations independently of modality, as far as possible.

It took 2 years for this new emphasis to flourish. Beginning in 1986, the attendance and the number of papers increased rapidly (as can be seen in the plots below).

Finally, it is important to note that every year for the past 40 years, the Center for Devices and Radiological Health, FDA (formerly, the Bureau for Radiological Health) has been a cosponsor or supporting organization. Further, many members of the CDRH/BRH have helped organize the meeting, such as Robert Wagner, Robert Jennings, Roger Schneider, David Brown and several others. Their contributions to this meeting mirror the impact that the CDRH/BRH have had on the field.

![Graphs showing attendance, total number of papers, and proceedings volume number over time.](image)

Figure 1. These plots capture some of the statistics from the meeting over time.

### 1.1 Fun Facts

Bob Wagner dubbed 1984-1987, the Palindrome Years.

The first digital mammography paper and the first dual-energy mammography paper were presented in 1983.

The first computer-aided diagnosis (CAD) paper was presented in 1985.

The first Proceedings (Vol. 35) had a black cover and was hard bound. All subsequent Proceedings had a yellow cover and were soft bound.

The first posters were in 1988. Each poster had 3 full poster boards and wine was served at the poster session.
Although there was no “Medical Imaging” meeting in 1978, there was another medical imaging themed conferences: Recent and Future Developments in Medical Imaging I; edited by Norman A. Baily.

In 2001, the proceedings were distributed on CD for the first time.

Table 1. Number of years serving as a Conference Chair (includes all Conferences) or serving on the Physics Committee (including being Chair). Years on Physics Committee includes committee membership when there was only a single conference and only the Physics Committee when there were multiple conferences.

<table>
<thead>
<tr>
<th>Years Served as a Conference Chair</th>
<th>Years Served on Physics Committee</th>
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<tr>
<td>Samuel J. Dwyer III 13</td>
<td>Robert F. Wagner 19</td>
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<td>Roger H. Schneider 12</td>
<td>Hans Roehrig 13</td>
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1.2 Summary of Each Meeting

Following is a brief summary of each meeting from 1972-2012. When there were multiple conferences at the meeting, the summary focuses mainly on the Physics Conference. I also have most of this information in an excel spreadsheet. It is available from the author to those who would like it.
Overview of the 40-Year History of the SPIE Medical Imaging Meeting

1972
Application of Optical Instrumentation In Medicine (In-depth-Seminar)
Chicago Nov 29-30
Vol. 35 29 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; BRH; ASNR; SMM; UWMS; AAPM
Chairs
William C. Zarnstorff, William R. Hendee, Paul L. Carson
Program Committee
Not listed
Sessions
Electro-Optical Instrumentation - William R. Hendee
Image Analysis, Enhancement and Evaluation - Paul L. Carson
Holographic and Video Images - William R. Hendee
Special Topics - William C. Zarnstorff
Panel Discussion - Jack S. Krohmer

1973
Application of Optical Instrumentation in Medicine II
Chicago Nov 29-30
Vol. 43 35 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE, AAPM; ASNR, AAMI; BRH; EMBG; OSA; SMM; SRE; SPSE
Chairs
William R. Hendee, William C. Zarnstorff, Paul L. Carson
Program Committee
Not listed
Sessions
Nuclear Medicine Imaging
Image Enhancement and Pattern Recognition
Panel Discussion: Image Enhancement for Medical Diagnosis Can It Be Effective?
Special Topics
Image Intensifier Systems
Transmission, Storage, Retrieval and Reconstruction of Images
Panel Discussion: Performance Standards and Possible Field Evaluation of Image Intensifiers

1974
Application of Optical Instrumentation in Medicine III
Kansas City, MO Aug 1-2
Vol. 47 45 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; BRH; AAPM, ARRS; EMBG
Chairs
Paul L. Carson, Edward L. Chaney, William R. Hendee
Program Committee
Not listed
Sessions
Transmission 3-Dimensional Image Reconstruction and Computerized Axial Tomography - William R. Hendee, Joseph Gallagher
Advanced Techniques of Imaging With Ultrasound - Paul L. Carson
Acoustic Exposure Determination In Diagnostic Ultrasound - James A. Rooney
Noise, Objective, and Psychophysical Measures - Joel E. Gray
Special Topics - Jacques Ovadia
Ray Tube Focal Spot Size and Intensity Distributions: Important Practical Considerations - Bengt E. Bjarngard
Automatic Brightness Control In Image-Intensified Fluoroscopy - William R. Hendee

1975
Application of Optical Instrumentation in Medicine IV
Atlanta, GA Sept. 25-27
Vol. 70 55 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; BRH; AAPM, ARRS, ACR, SRE
Chairs
Joel E. Gray, William R. Hendee
Program Committee
Not listed
Sessions
Quality Assurance, Film Handling & Film Processing - Joel E. Gray
Loading, Heat Rating, Other Characteristics of X-Ray Tubes - Edward L. Chaney
Information Extraction & Utilization From Radiologic Images - Marvin E. Hastin
Quality Assurance In Diagnostic Radiology: Why Doesn't Every Department Have A Complete Program? Panel Discussion -
Quality Assurance for Diagnostic Radiologic Instrumentation - James J. Vucich
Exposure Initiation/Termination Mechanisms and Automatic Exposure Timers In Diagnostic Radiology - Robert G. Waggener
Rare Earth Intensifying Screens - E. Dale Trout
Panel Discussion: Performance Specifications for Diagnostic Radiologic Equipment -
Gray-Scale Ultrasound Imaging & Tissue Identification - Paul L. Carson
Physical Evaluation of Computerized Axial Tomography - Raymond P. Rossi
Special Topics - Robert Rahnren
Performance Evaluation of Mammographic Imaging Systems - Gregory L. DuBoise

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1976
Application of Optical Instrumentation in Medicine V
Washington, DC Sept. 16-19
Vol. 96 76 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; BRH; ARRS; SRE
Chairs
Program Committee
Same as Editors
Sessions
Quality Assurance in Diagnostic Radiology I - Raymond P. Rossi
Quality Assurance in Diagnostic Radiology II - Thomas Stone
Computed Tomography I - Norman A. Baily
Radiographic Images and Dose - Arthur G. Haus
Computed Tomography II - Rodney A. Brooks
Computed Tomography III - Kenneth Werner
Diagnostic Ultrasound I - Paul L. Carson
Quality Assurance in Diagnostic Radiology III - Robert K. Cacak
Current Topics in Mammography - Gregory Dubuque

1977
Application of Optical Instrumentation in Medicine VI
Boston, MA Sept. 25-27
Vol. 127 60 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; BRH; ARRS; SRE
Chairs
Joel E. Gray, William R. Hendee
Program Committee
Robert F. Wagner, William Properzio, Arthur G. Haus, Joel Pierce Jones, Raymond Rossi
Sessions
The Laboratory/Clinical Interface in Image Evaluation - Robert Wagner
Sensitometry Update - Joel Gray
Screen Film Systems and Photostimulable Materials - Arthur G. Haus
Approaches to Equipment Service, Equipment Specification and Performance Evaluation - Raymond P. Rossi
New Developments in Medical Imaging - William Hendee
Quality Control in Medical Imaging - William S. Properzio
Performance Characteristics of CT Scanners - Robert K. Cacak
Small Group Sessions on Special Topics - Joint Session with ARRS

1978
No Meeting

1979
Application of Optical Instrumentation in Medicine VII
Toronto, Canada Mar 25-27
Vol. 173 55 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; SPSE; ARRS; BRH; SRE
Chairs
Joel E. Gray
Program Committee
Sessions
Imaging Systems: Physical Evaluation - Joel Gray
Imaging Systems: Perception Evaluation - Joel Gray
Imaging Systems: Special Topics - Arthur Haus
Mammography - William Properzio
Special Topics - Raymond Rossi
Computed Tomography: Practical Considerations - William R. Hendee
Computed Tomography: Theoretical Considerations - William R. Hendee
X-Ray Imaging Research in Toronto - K. W. Taylor
Joint Session with the ARRS - Joel Gray; William R. Hendee; Harry Z. Mellins
1980 Application of Optical Instrumentation in Medicine VIII
Las Vegas, NV Apr 20-22
Vol. 233 43 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; SPSE; ARRS; BRH; SRE
Chairs
Joel Gray, Arthur G. Haus, William R. Hendee, William S. Properzio
Program Committee
Same as Editors
Sessions
Screen-Film Evaluation - Arthur G. Haus
Unconventional Imaging Techniques - Joel Gray
Special Topics - Gerald Cohen
New Concepts in Conventional Imaging Techniques - James A. Mulvaney
How Might Exposure Values Be Determined for Radiological Exams? - William S. Properzio
Joint Session with the ARRS - Joel Gray; Joseph Cathoun

1981 Application of Optical Instrumentation in Medicine IX
San Francisco, CA Mar 22-24
Vol. 273 51 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; SPSE; AAPM; ARRS; BRH; SRE
Chairs
Joel E. Gray, Arthur G. Haus, William S. Properzio, James A. Mulvaney
Program Committee
Same as Editors
Sessions
Special Session: Nuclear Magnetic Resonance Imaging: Current Status - Leon Partain; A. Everette James, Jr.
Conventional Imaging Systems Evaluation - Arthur G. Haus
Digital Radiography - William S. Properzio
Quality Control - James A. Mulvaney
Nuclear Medicine - Joel E. Gray
Break-Out Session A: Nuclear Magnetic Resonance - C. Leon Partain
Break-Out Session B: Computerized Tomography - Gary D. Fullerton
Break-Out Session C: Digital Imaging - William S. Properzio
Break-Out Session D: Conventional Imaging Systems Evaluation - Joel E. Gray
Joint Session with the ARRS - Arthur G. Haus; James F. Martin
Recording, Storage, and Processing of Images - Joel E. Gray

1982 Application of Optical Instrumentation in Medicine X
New Orleans May 9-12
Vol. 347 58 papers Attendance: 300
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; ARRS; AAPM; BRH; SPSE; SRE
Chairs
Gary D. Fullerton, Arthur G. Haus, William S. Properzio, James A. Mulvaney
Program Committee
Same as Editors
Sessions
Special Session on Digital Radiography - Benjamin A. Arnold; Andrew B. Cramby
Conventional Imaging Systems Evaluation - Arthur G. Haus
Digital Radiography - William S. Properzio
Computed Tomography - James A. Mulvaney
Conventional Imaging Systems Evaluation - Charles A. Kelsey
Break-Out Session A: Digital Radiography - William S. Properzio
Break-Out Session B: Conventional Imaging - James A. Mulvaney
Break-Out Session C: Nuclear Magnetic Resonance (NMR) Imaging - Gary D. Fullerton
Joint Session with The ARRS - John Tampas; Gary D. Fullerton
Digital Radiography (Cosponsored by The ARRS and SPIE) - M. Paul Capp; William R. Hendee
Integrated Systems for Analysis and Display of Radiological Images - Michael J. Flynn
Nuclear Magnetic Resonance (NMR) (Cosponsored by ARRS and SPIE) - Raymond L. Nunnally
Nuclear Magnetic Resonance (NMR) Imaging - Gary D. Fullerton
New Modalities and Computers in Medical Imaging - Michael J. Flynn

1983 Application of Optical Instrumentation in Medicine XI
Atlanta Apr 17-20
Vol. 419 41 papers Attendance: 296
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; ARRS; AAPM; BRH SPSE; SRE
Chairs
Gary D. Fullerton
Program Committee
Arthur G. Haus, James A. Mulvaney, William Properzio
Sessions
Advances in Breast Imaging - Roger S. Powell
Conventional Imaging Systems Evaluation - Arthur G. Haus
Digital Radiography I - James A. Mulvaney
Image Performance Evaluation and Quality Assurance - William S. Properzio
Digital Radiography II - Stewart C. Bushong
Break-Out Session A: Nuclear Magnetic Resonance Imaging - Gary D. Fullerton
Break-Out Session B: Digital Radiography - William S. Properzio
Break-Out Session C: Conventional Imaging - James A. Mulvaney
Joint Session with SPIE and The ARRS - Melvin M. Figley; Gary D. Fullerton
Nuclear Magnetic Resonance Imaging - Gary D. Fullerton
New Modalities and Computers in Medical Imaging - Michael J. Flynn
1988
Medical Imaging II: Part A—Image Formation, Detection, Processing, and Interpretation
Newport Beach, CA
Jan 31-Feb 5
Vol. 914A
168 papers (102 in Physics)
Attendance: 570
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; ACR; CDRH; IRS
Chairs
Samuel J. Dwyer III, Roger H. Schneider
Program Committee
Ronald L. Arenson; Gary T. Barnes; Harrison H. Barrett; Roger A. Bauman; Arthur Burgess; Arthur N. Carson; Jerry Cohen; Kunio Doi; Aaron Fenster; Leonard A. Ferman; Kenneth M. Hanson; William R. Hendee; David G. Hill; Steven C. Hori; H. K. Huang; Robert J. Jennings; Robert A. Kruger; Bruce Lasinski; James Lai; Thomas R. Lawlay; Murray H. Lee; William C. Martineau; Laura Lee Murphy; Orhan Nalcioglu; Stephen M. Pizer; Judith M. S. Price; Ronald R. Price; Stephen J. Reddick; Hans Rohrig; Roger H. Schneider; Murray H. Loew; Edward V. Staab; Stephen R. Thomas; Robert F. Wagner; Henry N. Wagner, Jr.; Jason S. Zeitelkova
Sessions
Future Potential of the Several Candidate Signals for Medical Imaging - Roger H. Schneider
Image Formation I - Robert J. Jennings
Image Formation II - Aaron Fenster
Image Processing - Hans Roehrig
Future Potential of Tomography and 3D Mapping and Interpretation - Orhan Nalcioglu
Image Processing V: Tomography and 3D Mapping and Interpretation - Orhan Nalcioglu
Image Processing: Microscopy - Judith M. S. Prewitt
Digital Medical Photography - Roger A. Bauman
Other Conferences
Proc. of SPIE Vol. 8316  831601-30
1989
Medical Imaging III: Image Formation
Newport Beach, CA
Jan 29-31
Vol. 1090
235 papers (51 in Physics)
Attendance: 547
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; ACR; CDRH; IRS
Chairs
Samuel J. Dwyer III, R. Gilbert Jost M.D., Roger H. Schneider
Program Committee
Ronald L. Arenson; Harrison H. Barrett; Gary T. Barnes; Roger A. Bauman; David G. Brown; Arthur E. Burgess; Arthur Carson; Gerald Cohen; Kunio Doi; Aaron Fenster; Kenneth M. Hanson; William R. Hendee; David G. Hill; Steven C. Hori; H. K. Huang; Robert J. Jennings; Robert A. Kruger; James L. LeRah; Thomas K. Lewellen; Murray R. Low; Orhan Nalcioglu; Stephen M. Pizer; Judith H. S. Price; Ronald R. Price; Stephen J. Reddick; Hans Rohrig; Roger H. Schneider; Rodney Shaw; Stephen W. Smith; Edward V. Staab; Stephen R. Thomas; Robert F. Wagner
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Future Potential of the Several Candidate Signals for Medical Imaging - Roger H. Schneider
Image Formation I - Stephen J. Reddick
Image Formation II - Robert J. Jennings
Image Formation III - Arthur E. Burgess
Image Formation IV - Robert A. Kruger
Image Formation V - Kunio Doi
Image Formation VI - Ronald R. Price
Other Conferences
1990
Medical Imaging IV: Image Formation
Newport Beach, CA
Feb 4-6
Vol. 1231
270 papers (60 in Physics)
Attendance: 666
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; ACR; CDRH; NEMA
Chairs
Roger H. Schneider
Program Committee
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Sessions
Future Potential of Ultrasound, CT, and Optical Imaging - Robert F. Wagner
Future Potential of Ultrasound, CT, and Optical Imaging - Stephen W. Smith
Future Potential of Optical Imaging - William J. Dallas
Medical Imaging V: Image Physics
San Jose, CA
Feb 25-26
Vol. 1443
190 papers (26 in Physics)
Attendance: 500
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; ACR; CDRH; ISNEMA
Chairs
Roger H. Schneider
Program Committee
Harrison H. Barrett; David G. Brown; Arthur E. Burgess; William J. Dallas; Kunio Doi; Aaron Fenster; Robert J. Jennings; Robert A. Kruger; Pei-Jan P. Lin; Richard L. Morris; Orhan Nalcioglu; Hans Rohrig; Rodney Shaw; Stephen W. Smith; Stephen R. Thomas; Robert F. Wagner
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Future Potential of Ultrasound, CT, and Optical Imaging - Stephen W. Smith
Future Potential of Optical Imaging - William J. Dallas
Future Potential of Ultrasound, CT, and Optical Imaging - Stephen W. Smith
1991
Medical Imaging V: Image Physics
San Jose, CA
Feb 25-26
Vol. 1443
190 papers (26 in Physics)
Attendance: 500
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; ACR; CDRH; ISNEMA
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Future Potential of Optical Imaging - William J. Dallas
Future Potential of Ultrasound, CT, and Optical Imaging - Stephen W. Smith
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1444  Image Capture, Formatting, and Display  Samuel J. Dwyer III, R. Gilbert Jost  88
1445  Image Processing  Murray H. Lee  59
1446  PACS Design and Evaluation  R. Gilbert Jost  57

XXX
### 1992
**Medical Imaging VI: Instrumentation**
Newport Beach, CA 23-24 February
Vol. 1651  221 papers (27 in Physics)  Attendance: 539

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; CDRH; NEMA; IS&T

**Chairs**
Rodney Shaw

**Program Committee**
Harrison H. Barnett; David G. Brown; Arthur E. Burgess; William J. Dallas; Kusio Doi; Aaron Faro; Robert J. Jennings; Robert A. Kruger; Pei-Jan Paul Lin; Richard L. Morin; Orhan Nalcioglu; Hans Roehrig; Roger H. Schneider; Stephen W. Smith; Stephen R. Thomas; Robert F. Wagner

**Sessions**
Image Instrumentation I - David G. Brown
Image Instrumentation II - Arthur E. Burgess
Image Instrumentation III - William J. Dallas
Image Instrumentation IV - Hans Roehrig
Poster Session

### 1993
**Medical Imaging 1993: Physics of Medical Imaging**
Newport Beach, CA 14-15 February
Vol. 1896  250 papers (45 in Physics)  Attendance: 754

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; CDRH; NEMA; IS&T; SCAR

**Chairs**
Rodney Shaw

**Program Committee**
Jacob Beutel; Arthur E. Burgess; Robert J. Jennings; Hans Roehrig; Richard L. Van Metter; Robert F. Wagner

**Sessions**
Physics of Medical Imaging I - Robert F. Wagner
Physics of Medical Imaging II - Rodney Shaw
Physics of Medical Imaging III - Hans Roehrig
Physics of Medical Imaging IV - Robert F. Wagner
Physics of Medical Imaging V - Robert J. Jennings
Physics of Medical Imaging VI - Jacob Beutel
Physics of Medical Imaging VII - Richard L. Van Metter

### 1994
**Medical Imaging 1994: Physics of Medical Imaging**
Newport Beach, CA 13-14 February
Vol. 2163  349 papers (60 in Physics)  Attendance: 1073

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; CDRH; NEMA; IS&T; RISC; RSNA; SCAR

**Chairs**
Rodney Shaw

**Program Committee**
Jacob Beutel; John M. Boone; Randall P. Brown; Robert J. Jennings; Hans Roehrig; Richard L. Van Metter; Robert P. Wagner; Martin J. Yaffe; Herbert D. Zeman

**Sessions**
Physics of Medical Imaging I - Hans Roehrig
Physics of Medical Imaging II - Martin J. Yaffe
Physics of Medical Imaging III - Randall P. Brown
Physics of Medical Imaging IV - Robert J. Jennings
Physics of Medical Imaging V - John M. Boone

### 1995
**Medical Imaging 1995: Physics of Medical Imaging**
San Diego, CA 26-27 February
Vol. 2432  349 papers (60 in Physics)  Attendance: 1034

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RISC; RSNA; SCAR

**Chairs**
Richard L. Van Metter, Jacob Beutel

**Program Committee**
Larry E. Antonuk; Gary T. Barnes; John M. Boone; Randall P. Brown; Ian A. Cunningham; Frank A. DiBianca; James T. Dobin; Robert J. Endorf; Robert Jennings; Hans Roehrig; Robert F. Wagner; Martin J. Yaffe; Herbert D. Zeman

**Sessions**
Image Quality and X-Ray Physics I - John M. Boone
Image Quality and X-Ray Physics II - Robert J. Jennings
Image Quality and X-Ray Physics III - Hans Roehrig

**Other Conferences**

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<th>Title</th>
<th>Editor/Conference Chair</th>
<th># of papers</th>
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<td>Image Processing</td>
<td>Murray H. Low</td>
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<td>1653</td>
<td>Image Capture, Formatting, and</td>
<td>Yongmin Kim</td>
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<td>1654</td>
<td>PACS Design and Evaluation</td>
<td>R. Gilbert Jost</td>
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<td>1867</td>
<td>Image Capture, Formatting, and</td>
<td>Yongmin Kim</td>
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### 1996
**Medical Imaging 1996: Physics of Medical Imaging**
San Diego, CA 26-27 February
Vol. 2432  349 papers (60 in Physics)  Attendance: 1034

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RISC; RSNA; SCAR

**Chairs**
Richard L. Van Metter, Jacob Beutel

**Program Committee**
Larry E. Antonuk; Gary T. Barnes; John M. Boone; Randall P. Brown; Ian A. Cunningham; Frank A. DiBianca; James T. Dobin; Robert J. Endorf; Robert Jennings; Hans Roehrig; Robert F. Wagner; Martin J. Yaffe; Herbert D. Zeman

**Sessions**
Image Quality and X-Ray Physics I - John M. Boone
Image Quality and X-Ray Physics II - Robert J. Jennings
Image Quality and X-Ray Physics III - Hans Roehrig

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<td>2440</td>
<td>PACS Design and Evaluation</td>
<td>R. Gilbert Jost</td>
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<td>R. Gilbert Jost</td>
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**Other Conferences**

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<tr>
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<td>PACS Design and Evaluation</td>
<td>R. Gilbert Jost</td>
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2011

Medical Imaging 2011: Physics of Medical Imaging

Lake Buena Vista, FL  13–17 February
Vol. 7961  864 papers (204 in Physics)  Attendance: 1136

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CARS; IS&T MIPS; RSNA; SIIM; SMI; DICOM

Chairs
Norbert J. Pelc, Ehsan Samei, Robert M. Nishikawa

Program Committee
Guang-Hong Chen; Dianna Cody; Mats Danielsson; Maria Drangova; Thomas Flohr; Stephen J. Glick; Michael Grass; Christoph Hoeschen; Marc Kachelriess; Karim S. Karim; Hee-Joung Kim; Despina Kontos; Iacovos Kyprianou; Jinyi Qi; John A. Rowlands; John M. Sabol; Taly Gilat Schmidt; Jeffrey H. Siewerdsen; Katsuyuki Taguchi; Anders Tingberg; Bruce R. Whiting; John Yorkston;

Sessions
Keynote and Imaging and Health Economics - Norbert J. Pelc; Ehsan Samei
X-ray Imaging - John A. Rowlands; Christoph Hoeschen
Metrology - Robert M. Nishikawa; John Yorkston
Iterative and Statistical Reconstruction - Jinyi Qi; Guang-Hong Chen
Detectors I & II- John Yorkston; John A. Rowlands / Karim S. Karim; Mats Danielsson
Breast Imaging - Anders Tingberg; Stephen J. Glick
Tomosynthesis I: Reconstruction - John M. Sabol; Michael Grass
Tomosynthesis II - Despina Kontos; Anders Tingberg
X-ray Imaging: Phase Contrast Diffraction - Jeffrey H. Siewerdsen; Taly Gilat Schmidt
Image Reconstruction - Bruce R. Whiting; Katsuyuki Taguchi
CT III: Multi-energy - Thomas G. Flohr; John M. Sabol
Novel Systems - Mats Danielsson; Taly Gilat Schmidt
CT IV: Cone Beam - Maria Drangova; Marc Kachelriess
Dose - Iacovos S. Kyprianou; Hee-Joung Kim
Two Special Sessions on Dose with a Panel Discussion - Ehsan Samei; Dianna D. Cody / Christoph Hoeschen; Michael F. McNitt-Gray / Ehsan Samei

Proc. of SPIE Vol. 8316  831601-36
2012

Medical Imaging 2012: Physics of Medical Imaging
San Diego, CA  Feb 5-9
Vol. 8313  909 papers (233 in Physics)  Attendance: ?

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CARS; MIPS; RSNA; SIIM; SMI; WMIS; DICOM

Chairs
Norbert J. Pelc, Robert M. Nishikawa, Bruce Whiting

Program Committee
Hilde Bosmans; Guang-Hong Chen; Dianna D Cody; Mats E Danielsson; Maria Drangova; Thomas G. Flohr; Stephen J. Glick; Michael Grass; Christoph Hoeschen; Marc Kachelriess; Karim S Karim; Hee-Joung Kim; Despina Kontos; Iacovos S. Kyprianou; Joseph Y Lo; Jinyi Qi; John A Rowlands; John M Sabol; Taly G. Schmidt; Jeffrey H. Siewerdsen; Anders Tingberg; John Yorkston

Sessions
Keynote and 3D Breast Imaging - Norbert J. Pelc; Robert M. Nishikawa
3D Breast Imaging - Hilde Bosmans; Joseph Y. Lo
Breast Multi-Energy/Photon Counting - Mats E. Danielsson; Stephen J. Glick
Mammography - Anders Tingberg; Despina Kontos
X-Ray Imaging - Hee-Joung Kim; Karim S. Karim
Small Animal Imaging - John Yorkston; Maria Drangova
Photon Counting Systems and Techniques - Taly G. Schmidt; Jeffrey H. Siewerdsen
General Radiography and Fluoroscopy - John A. Rowlands; Hee-Joung Kim
Cone Beam CT - Iacovos S. Kyprianou; John Yorkston
CT - Dianna D. Cody; Marc Kachelriess
CT Detection Performance - Jinyi Qi; Bruce R. Whiting
Dose - Christoph Hoeschen; Dianna D. Cody
Reconstruction I & II - Guang-Hong Chen; Michael Grass/ Thomas Flohr; Jeff Siewerdsen
Tomosynthesis Reconstruction - John M. Sabol; Iacovos S. Kyprianou
Abbreviations

<table>
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AAMI</td>
<td>Association for the Advancement of Medical Instrumentation</td>
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<tr>
<td>AAPM</td>
<td>American Association of Physicists in Medicine</td>
</tr>
<tr>
<td>ACR</td>
<td>American College of Radiology</td>
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<td>APS</td>
<td>American Physiological Society</td>
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<td>ARRS</td>
<td>American Roentgen Ray Society</td>
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<td>ASNR</td>
<td>American Society of Neuroradiology</td>
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<tr>
<td>BIOS</td>
<td>Biomedical Optics Society</td>
</tr>
<tr>
<td>BRH</td>
<td>Bureau of Radiological Health, Department of Health, Education And Welfare</td>
</tr>
<tr>
<td>CARS</td>
<td>Computer Assisted Radiology and Surgery</td>
</tr>
<tr>
<td>CDRH</td>
<td>Center for Devices and Radiological Health, FDA</td>
</tr>
<tr>
<td>DICOM</td>
<td>The DICOM Standards Committee</td>
</tr>
<tr>
<td>EFOMP</td>
<td>European Federation of Organizations for Medical Physics</td>
</tr>
<tr>
<td>EMBG</td>
<td>IEEE Engineering in Medicine and Biology Group</td>
</tr>
<tr>
<td>EMBS</td>
<td>IEEE—The Institute of Electrical and Electronics Engineers/Engineering in Medicine and Biology Society</td>
</tr>
<tr>
<td>IEEE-CS</td>
<td>IEEE Computer Society, Technical Committee on Computational Medicine</td>
</tr>
<tr>
<td>IRS</td>
<td>Institute for Regulatory Science</td>
</tr>
<tr>
<td>IS&amp;T</td>
<td>The Society for Imaging Science and Technology</td>
</tr>
<tr>
<td>JPL</td>
<td>Jet Propulsion Laboratory</td>
</tr>
<tr>
<td>MIPS</td>
<td>Medical Image Perception Society</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Electrical Manufacturers Association/Diagnostic Imaging and Therapy, Systems Division</td>
</tr>
<tr>
<td>OSA</td>
<td>The Optical Society of America</td>
</tr>
<tr>
<td>RISC</td>
<td>Radiology Information System Consortium</td>
</tr>
<tr>
<td>RSNA</td>
<td>Radiological Society of North America</td>
</tr>
<tr>
<td>SCAR</td>
<td>Society for Computer Applications in Radiology</td>
</tr>
<tr>
<td>SIIM</td>
<td>Society for Imaging Informatics in Medicine</td>
</tr>
<tr>
<td>SMI</td>
<td>The Society for Molecular Imaging</td>
</tr>
<tr>
<td>SNM</td>
<td>The Society of Nuclear Medicine</td>
</tr>
<tr>
<td>SPIE</td>
<td>The Society of Photo-Optical Instrumentation Engineers</td>
</tr>
<tr>
<td>SPSE</td>
<td>The Society of Photographic Scientists and Engineers</td>
</tr>
<tr>
<td>SRE</td>
<td>Society for Radiological Engineering</td>
</tr>
<tr>
<td>UWMS</td>
<td>University of Wisconsin Medical School</td>
</tr>
<tr>
<td>WMIS</td>
<td>World Molecular Imaging Society</td>
</tr>
</tbody>
</table>