Image-Guided Interventions: Applications, Modalities, and Future
Michael Vannier, M.D.
Professor of Radiology, University of Iowa

Robot-Assisted and 3D Ultrasound-Guided Prostate Brachytherapy
Aaron Fenster, Ph.D.
Director of the Imaging Research Department, Robarts Research Institute
Professor of Medical Biophysics, University of Western Ontario

Image-Guided Interventions: Imaging, Simulation, Modeling, and Robotics
Ron Kikinis, M.D.
Director of the Surgical Planning Laboratory, Brigham and Women's Hospital
Professor of Radiology, Harvard Medical School

Advances in Image-Guided Radiation Therapy
T. Rock Mackie, Ph.D.
Professor of Medical Physics, University of Wisconsin

The development and integration of advanced imaging techniques for the theatre of image-guided interventional procedures is among the most vital and challenging areas of medical physics research and clinical investigation. With the shared goal of increasing the precision and efficacy of medical procedures, investigation in the field includes multi-modality imaging physics, simulation and modeling, image segmentation and registration, robotics, guidance systems, and therapy monitoring. The Image-Guided Therapy Symposium provides a joint forum for Diagnostic and Therapy sessions in which expert invited speakers present on recent advances and future directions in:

- Robotics and computer-assisted surgery
- Multi-modality image-guided interventions
- Image-guided radiation therapy and brachytherapy
- Imaging, simulation, and modeling for guided procedures

The state of the art and future of advanced imaging and therapeutic techniques will be discussed, with special emphasis on the role of the physicist in this rapidly developing field. As a joint symposium, the session will feature open discussion with a multi-disciplinary panel of experts and should be of interest to diagnostic and therapy attendees alike.

Educational objectives:

- Understand the differing requirements of imaging systems for diagnostic and image-guided procedures;
- Learn of the technologies critical to image-guided interventions, including medical robotics, tracking and guidance systems, image registration, and navigation;
- Understand the principles and methodology of multi-modality image acquisition, reconstruction, registration, and tracking in image-guided therapy;
- Gain an awareness of current and future strategies for imaging in image-guided interventional procedures;
- Identify the role of the medical physicist in research and clinical implementation of systems for image-guided interventions.