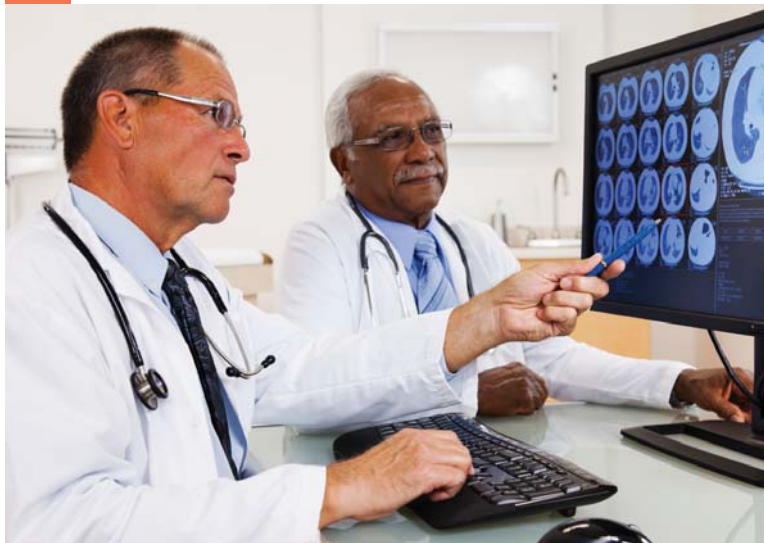


**POCKET PROGRAM**

2013

# Cancer Imaging and Radiation Therapy Symposium

*A Multidisciplinary Approach*



FEBRUARY 8-9, 2013

HILTON ORLANDO LAKE BUENA VISTA  
IN THE WALT DISNEY WORLD RESORT,  
ORLANDO

CO-SPONSORED BY:

**ASTRO**  
TARGETING CANCER CARE

**RSNA**  
Radiological Society  
of North America

## STEERING COMMITTEE MEMBERS



**Kevin A. Camphausen, MD**  
National Cancer Institute



**Suresh K. Mukherji, MD**  
University of Michigan Health System

## PROGRAM COMMITTEE MEMBERS

### ASTRO

**Laura A. Dawson, MD**  
Princess Margaret Hospital

**Quynh-Thu Le, MD**  
Stanford School of Medicine

**Ramesh Rengan, MD, PhD**  
University of Pennsylvania

**Julia R. White, MD**  
Ohio State University

### RSNA

**Jared D. Christensen, MD**  
Duke University Medical Center

**Michael A. Cohen, MD**  
Emory University

**Hugh D. Curtin, MD**  
Massachusetts Eye and Ear Infirmary

**Isaac R. Francis, MD**  
University of Michigan Health System

## SYMPOSIUM OVERVIEW

### STATEMENT OF NEED

The practice of radiation oncology was founded and has developed on a solid base of medical imaging. As imaging improves, so does radiation therapy. Loco-regional control remains essential for the cure of the majority of malignant tumors. Increasing radiation dose increases the chance for cure but carries risks of serious toxicity. New radiation delivery systems allow for the delivery of radiation with much greater conformality than ever before, but without good definition of the tumor target, this advantage is squandered.

Therefore, the radiation oncologist must better understand the interpretation of contemporary radiographic images and the additional value from new imaging modalities. The radiologist, on the other hand, needs to better understand the needs of the radiation oncologist in defining target volumes for advanced radiation techniques.

The American Society for Radiation Oncology (ASTRO) and the Radiological Society of North America (RSNA) have joined together in the co-sponsorship of this symposium.

### MEDIA TEAM

**Michael A. Cohen, MD**  
Emory University, Atlanta  
RSNA Representative

**Suresh K. Mukherji, MD**  
University of Michigan Health System, Ann Arbor, Mich.  
RSNA Representative

**Ramesh Rengan, MD, PhD**  
University of Pennsylvania, Philadelphia  
ASTRO Representative

**Julia R. White, MD**  
Ohio State University, Columbus, Ohio  
ASTRO Representative

## CONTINUING EDUCATION INFORMATION

### PHYSICIANS

#### **Accreditation Statement**

The American Society for Radiation Oncology is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

### CREDIT DESIGNATION

ASTRO designates this live educational activity for a maximum of 13 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

### PHYSICISTS

CAMPEP approval is pending for medical physics continuing education credit (MPCEC) hours.

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### EVALUATION

To be eligible to receive continuing education credit, attendees must complete the electronic evaluation by Monday, March 11, 2013. Personalized links will be sent to the email address on file from your registration immediately following the meeting. To receive credit for your participation at this meeting, your evaluation must be completed by the deadline. Submissions received after the deadline will not be processed. Please only evaluate the sessions you attended.

### CERTIFICATES OF CREDIT

CME certificates of credit are only available to participants who have completed the online evaluation tool. Participants have 30 days to complete the evaluation and will have online access to their certificate 60 days post-meeting. Participants can access, print and save their certificate from the My ASTRO page of the ASTRO website. Participants who do not complete their evaluations within 30 days must contact ASTRO (education@astro.org) to receive their certificate.

Physicist attendees will not receive a certificate of credit from ASTRO. The names of physicist attendees will be sent to CAMPEP 60 days after the meeting.

### DISCLOSURE OF VESTED INTEREST

ASTRO is an accredited provider of continuing medical education. Since our accreditation is important to us, we plan activities that are compliant with the ACCME and the content or format of CME activities and related materials will promote improvements or quality in health care and not a specific proprietary business interest or commercial bias. Planning Committee members and speakers are required to disclose the existence of any financial or other relationship with the manufacturer(s) of any commercial product(s) or provider(s) of any commercial services discussed in an educational presentation.

Any conflicts of interest are resolved prior to participation. In addition to written disclosure, presenters will disclose any vested interest or their intention to discuss off-label use of pharmaceuticals or devices, if applicable, to the audience at the beginning of their presentation and in accordance with ACCME standards and the Food and Drug Administration requirements.

In an effort to increase transparency and easy access to all disclosures, faculty, committee and presenter disclosure information will be available online for the 2013 Cancer Imaging and Radiation Therapy Symposium. In addition to being available online at <http://cancerimagingandrt Symposium.org/MeetingProgram/Schedule.htm>, disclosure slides will be shown at the beginning of each session. Disclosure information will not be printed in paper versions of the meeting materials.

## GENERAL INFORMATION

### HOTEL INFORMATION

Hilton Orlando Lake Buena Vista in the  
Walt Disney World Resort  
1751 Hotel Plaza Blvd.  
Lake Buena Vista, FL 32830

### REGISTRATION LOCATION AND HOURS

The Registration and Information Desk is located on the lobby level of the hotel and will be open during the following hours:

Thursday, February 7, 2013	3:00 p.m. – 6:00 p.m.
Friday, February 8, 2013	7:00 a.m. – 4:30 p.m.
Saturday, February 9, 2013	7:00 a.m. – 4:00 p.m.

### GENERAL SESSIONS

All sessions will take place in the International Ballroom on the lobby level.

### BREAKOUT SESSIONS

Breakout Sessions will be held in the International Ballroom. Signs will be posted to help you locate the Breakout Session you wish to attend.

### EXHIBIT HALL LOCATION AND HOURS

The Exhibit Hall is located in the Grand Ballroom and will be open during the following hours:

Friday, February 8, 2013	7:00 a.m. – 5:30 p.m.
Saturday, February 9, 2013	7:00 a.m. – 2:00 p.m. 2:15 p.m. – 4:00 p.m. (Poster tear-down only)

### FACULTY REGISTRATION AND PRESENTER READY ROOM

The Faculty Registration and Presenter Ready Room is located in the Crystal Room. Computers are available to preview your presentation. All presenters are requested to stop by the Faculty Registration and Presenter Ready Room the day before their session is being given so that their presentation can be uploaded. The Faculty Registration and Presenter Ready Room will be open during the following hours:

Thursday, February 7, 2013	3:00 p.m. – 6:00 p.m.
Friday, February 8, 2013	7:00 a.m. – 4:30 p.m.
Saturday, February 9, 2013	7:00 a.m. – 4:00 p.m.

### POSTER RECEPTION

A poster reception open to all attendees will be held in the Exhibit Hall on Friday, February 8, from 4:30 p.m. to 5:30 p.m.

### BREAKFAST, LUNCH AND COFFEE BREAKS

#### Breakfast

Continental breakfast will be provided Friday and Saturday in the Exhibit Hall located in the Grand Ballroom.

#### Coffee Breaks

Morning and afternoon coffee breaks will be provided Friday and Saturday in the Exhibit Hall located in the Grand Ballroom.

#### Lunch

Lunch will be provided on Friday and Saturday in the Exhibit Hall located in the Grand Ballroom.

### AGE REQUIREMENT FOR ATTENDEES

Due to the detailed nature of the programs and forums, no one under the age of 18 will be admitted to any official symposium function. This includes, but is not limited to, all symposium sessions and the exhibits/food room.

### NAME BADGES

Attendees and guests are requested to wear their name badge at all times during the meeting. This is your ticket into the session rooms and verifies your registration.

### DRESS

Business Casual

## LOST AND FOUND

### *Registration Desk on the Lobby Level*

Lost and found items are available at the Registration and Information Desk. Please stop by to inquire about any missing items.

## NO RECORDING

No audio recording, videotaping or flash photography is permitted at any time during the meeting.

## POSTER VIEWING

### *Exhibit Hall, Grand Ballroom*

Posters will be on display for viewing in the Exhibit Hall on Friday and Saturday. Please refer to the Exhibit Hall Location and Hours section on page 4 for the hours of operation.

# PROGRAM AGENDA

INTERACTIVE SESSION 

## THURSDAY, FEBRUARY 7, 2013

**3:00 p.m. – 6:00 p.m.**

### **Registration**

*Registration Desk, Lobby Level*

## FRIDAY, FEBRUARY 8, 2013

**7:00 a.m. – 4:30 p.m.**

### **Registration**

*Registration Desk, Lobby Level*

**7:00 a.m. – 8:00 a.m.**

### **Continental Breakfast**

*Exhibit Hall, Grand Ballroom*

**7:50 a.m. – 8:00 a.m.**

### **Welcome**

*International Ballroom*

Suresh K. Mukherji, MD, University of Michigan Health System, Ann Arbor, Mich.

**8:00 a.m. – 10:00 a.m.**

### **General Session I: Clinical Applications of New Imaging Techniques in Oncology**

*International Ballroom*

#### *Moderator:*

Suresh K. Mukherji, MD, University of Michigan Health System, Ann Arbor, Mich.

#### *Speakers:*

- **Interventional Oncology**  
Daniel B. Brown, MD, Thomas Jefferson University, Philadelphia
- **Update of Automated Segmentation Techniques: A Clinical Perspective**  
Edward Graves, MD, Stanford University School of Medicine, Stanford, Calif.
- **4-D CT**  
Dwight Heron, MD, UPMC Cancer Centers, Pittsburgh

#### *Abstract Presentations:*

- **1: CT-Guidance Allows Interstitial Implantation in an Outpatient Setting for Cervical Cancer Patients**  
Michael Bernstein
- **2: 4DMRI Provides More Accurate Renal Motion Estimation in IMRT in Young Children**  
Atmaram Pai Panandiker
- **3: Knowledge-based Organ-at-Risk Sparing Models in IMRT Planning**  
Q. Jackie Wu

This session will focus on current methods for delineating tumor and organ contours from anatomic and molecular imaging data, including both current clinical standard techniques and emerging strategies such as automated image analysis, atlas-based approaches, implementation of 4-D CT and motion management in modern radiation oncology practice. The use of minimally-invasive image-guided therapies for cancer will be covered; techniques described will include intra-arterial chemoembolization and radioembolization as well as tumor ablation with radiofrequency and microwave energy, cryoablation and irreversible electroporation.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Discuss the impact of respiratory and organ motion.
2. Apply knowledge gained to a clinical and motion management program.
3. Define the current clinical practice for definition radiotherapy target volumes and organs at risk from both anatomic (MR, CT) and functional (PET, MRS) imaging datasets.
4. Explain new semi-automated and automated methods for target volume definition for radiotherapy, and elucidate the strengths and weaknesses of these emerging techniques as well as their suitability to clinical incorporation.
5. Discuss indications and outcomes of intra-arterial therapy of hepatic malignancy.
6. Discuss outcomes of thermal ablation of renal malignancy.

**10:00 a.m. – 10:30 a.m.**

#### **Break**

*Exhibit Hall, Grand Ballroom*

**10:30 a.m. – 12:30 p.m.**

#### **General Session II: How Has Imaging Changed What We Do: Adaptive Radiotherapy** *International Ballroom*

#### *Moderator:*

Kristy Brock, PhD, University of Michigan, Ann Arbor, Mich.

#### *Speakers:*

- **Views of the Future**  
Perry Grigsby, MD, Washington University School of Medicine, St. Louis
- **Tools Needed**  
Kristy Brock, PhD, University of Michigan, Ann Arbor, Mich.
- **Clinical Applications**  
Paul Read, MD, University of Virginia, Charlottesville, Va.

#### *Abstract Presentations:*

- **4: Hepatic Function Model Based Upon HIDA SPECT and Dose for Physiological Adaptive RT**  
Hesheng Wang
- **5: In Vivo Verification as a Tool to Tailor Daily IGRT and Flag Adaptive Radiotherapy**  
Gustavo Olivera
- **6: Image Guided Concomitant Boost Radiotherapy Technique Leads to Safe Dose Escalation and Improves Local Tumor Control**  
Despina Katsochi

Adaptive radiation strategies require advanced software for image registration (including deformable registration) as well as dose summation. This session will cover how real time adaptive radiation therapy will require rapid treatment planning and novel quality assurance methods to ensure patient safety. The safe implementation of image registration and dose summation will be described and the use of adaptive radiotherapy in the daily clinical management of patients with cancer will be illustrated. The STAT RAD platform will be highlighted to demonstrate a real time adaptive radiation therapy workflow.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Define tumor changes during RT for cervical cancer.
2. Evaluate data on the efficacy of nonanthracycline regimens for patients with advanced breast cancer.
3. Explain the potential relative impact of these combinations compared with traditional anthracycline regimens.
4. Define patient populations that could be most appropriate for management.
5. Discuss the safe implementation of image registration and dose accumulation.

**12:30 p.m. – 1:30 p.m.**

**Lunch**

*Exhibit Hall, Grand Ballroom*

**1:30 p.m. – 2:00 p.m.**

**General Session III: Keynote I – Imaging Tumor Response: Challenges of Heterogeneity**  
*International Ballroom*

**Moderator:**

Suresh K. Mukherji, MD, University of Michigan Health System, Ann Arbor, Mich.

**Speaker:**

David Piwnica-Worms, MD, PhD, Washington University School of Medicine, St. Louis

Large-scale sequencing analyses of solid cancers have identified extensive genetic inter-tumor and intra-tumor heterogeneity, which likely contribute to treatment failure and drug resistance. For example, recent unbiased whole genome sequencing approaches have highlighted the complexity of the mutational landscape of ER+ luminal breast cancers. In 46 breast tumors, 82,000 total somatic mutations and 2,000 tier 1 mutations were identified. While pathway signatures enabled the evaluation of mutations with low recurrence frequency where statistical comparisons conventionally were underpowered, this massive heterogeneity presents an enormous challenge for therapy and prognostic assessment of cancer. Furthermore, using a  $\kappa B_5 > \kappa B\alpha$ -FLuc bioluminescent reporter as one example, we rigorously evaluated the dynamics of  $\kappa B\alpha$  degradation and subsequent NF- $\kappa B$  transcriptional activity in response to diverse modes of TNF $\alpha$  stimulation in isogenic tumor cells. Tremendous heterogeneity in the transcriptional amplitudes of responding cells was observed. Thus, systems heterogeneity was observed even in isogenic cells, further adding to the complexity of cellular responses and their

associated signaling networks. One must conclude that inter-tumor and intra-tumor heterogeneity at the level of cancer genes and systems responses may have important consequences for targeted molecular imaging strategies that commonly lack spatial and temporal resolution in their depiction of tumor phenotypes.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Discuss the impact of tumor heterogeneity on imaging.
2. Explain the challenges of tumor heterogeneity for imaging.

**2:00 p.m. – 2:30 p.m.**

**Break**

*Exhibit Hall, Grand Ballroom*

**2:30 p.m. – 4:30 p.m.**

**Breakout Session I (Concurrent): Lung**  
*International Ballroom*

**Moderators:**

Jared D. Christensen, MD, Duke University Medical Center, Durham, N.C.

Ramesh Rengan, MD, PhD, University of Pennsylvania, Philadelphia

**Speakers:**

- **Functional Imaging in NSCLC: Applications from Staging to Treatment Response**  
Chaitanya Divgi, MD, Columbia University Medical Center, New York
- **Non-operative Local Treatment for NSCLC: SBRT and Ablative Therapies**  
Jared D. Christensen, MD, Duke University Medical Center, Durham, N.C.  
Christopher Kelsey, MD, Duke University Medical Center, Durham, N.C.
- **Targeted Therapy in NSCLC: Imaging Correlates and Applications to Stage III Disease**  
Daniel Pryma, MD, University of Pennsylvania, Philadelphia  
Ramesh Rengan, MD, PhD, University of Pennsylvania, Philadelphia
- **Practical Applications of Image Guidance for RT in Lung Cancer: Leveraging Imaging to Improve the Therapeutic Ratio**  
Indrin J. Chetty, PhD, Henry Ford Hospital and Health Centers, Detroit



The session will introduce the attendee to the application of imaging to the diagnosis, therapeutic planning, treatment and response assessment of patients with thoracic malignancies. Specific topics addressed will be the application of novel functional imaging approaches from diagnosis to response assessment; novel image-intensive therapeutic approaches to early stage disease; image assessment of targeted therapy in non-small cell lung cancer; and utility of image-guidance to improve therapeutic outcome in lung cancer. In the review of non-operative treatment modalities for early-stage non-small cell lung cancer including stereotactic body radiation therapy, specific topics of discussion will include the selection of patients for each modality including relative and absolute contraindications, effective treatment techniques, possible toxicities, expected clinical outcomes and future directions including current trials.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Evaluate the data on functional imaging in the management of lung cancer.
2. Discuss the relative advantages and disadvantages of SBRT vs. interventional ablative strategies for inoperable NSCLC.
3. Define the appropriate IGRT techniques in treatment verification of lung cancer.

**2:30 p.m. – 4:30 p.m.**

**Breakout Session II (Concurrent): Gastrointestinal International Ballroom**

**Moderators:**

Isaac R. Francis, MD, University of Michigan Health System, Ann Arbor, Mich.  
John Kim, MD, Princess Margaret Hospital, Toronto, Ontario, Canada

**Speakers:**

- **State of the Art CT and MRI for Staging of HCC**  
Tae Kyoung Kim, MD, Toronto General Hospital, Toronto, Ontario, Canada
- **Challenges in Target and Normal Tissue Delineation for HCC RT**  
John Kim, MD, Princess Margaret Hospital, Toronto, Ontario, Canada
- **Liver Q&A**  
John Kim, MD, Princess Margaret Hospital, Toronto, Ontario, Canada  
Tae Kyoung Kim, MD, Toronto General Hospital, Toronto, Ontario, Canada

- **Resectable, Borderline Resectable and Unresectable Status Definition in Pancreatic Cancer**

Alec J. Megibow, MD, MPH, New York University, New York

- **Target Delineation for Locally Advanced and (Neo) Adjuvant Pancreas Cancer**

Edgar Ben Josef, MD, University of Pennsylvania, Philadelphia

- **Pancreas Q&A**

Edgar Ben Josef, MD, University of Pennsylvania, Philadelphia

Alec J. Megibow, MD, MPH, New York University, New York

- **MRI Staging of Anorectal Cancer**

Koenraad Morteale, MD, Beth Israel Deaconess Medical Center, Boston

- **Target Volume Delineation in Anal and Rectal Canal IMRT**

Prajnan Das, MD, MS, MPH, MD Anderson Cancer Center, Houston

- **Anorectal Q&A**

Prajnan Das, MD, MS, MPH, MD Anderson Cancer Center, Houston

Koenraad Morteale, MD, Beth Israel Deaconess Medical Center, Boston

In the conformal radiation therapy era (3-D CRT, IMRT, SBRT), the need for optimal imaging strategies is paramount for diagnosis and tumor delineation. The session will provide updates on the staging and treatment of GI tract neoplasms, specifically hepatocellular (HCC), pancreas and anorectal cancers. The current role for CT and MR imaging for staging and radiation target delineation for HCC, pancreas and rectal cancers will be reviewed. There will be a focus on differentiating HCC from benign perfusion abnormalities and diagnosing tumor thrombosis in the portal or hepatic veins. The evolving role of MRI in the staging of rectal cancers will be discussed as well as contouring of targets for patients treated with IMRT for anal and rectal cancer. Optimized imaging, whether by CT or MRI, is necessary to properly identify those patients with pancreatic adenocarcinoma who will benefit from immediate surgery (resectable), possible neo-adjuvant therapy (borderline resectable) or non-surgical therapy (unresectable). This session will discuss optimal imaging for pancreatic adenocarcinoma.



*At the conclusion of this activity, the learner will be able to do the following:*

1. Summarize the roles of imaging techniques in staging GI tract cancers.
2. Discuss the limitations and strengths of various imaging techniques in staging GI tract cancers.
3. Discuss recommended GI radiation therapy target and normal tissue contouring guidelines.
4. Explain challenges in target definition for GI cancer radiation therapy.

**4:30 p.m. – 5:30 p.m.**

**Poster Session and Reception**

*Exhibit Hall, Grand Ballroom*

## **SATURDAY, FEBRUARY 9, 2013**

**7:00 a.m. – 4:00 p.m.**

**Registration**

*Registration Desk, Lobby Level*

**7:00 a.m. – 8:00 a.m.**

**Continental Breakfast**

*Exhibit Hall, Grand Ballroom*

**7:55 a.m. – 8:00 a.m.**

**Welcome**

*International Ballroom*

Kevin A. Camphausen, MD, National Cancer Institute, Bethesda, Md.

**8:00 a.m. – 10:00 a.m.**

**General Session IV: How Has Imaging Changed**

**What We Do: Biomarkers**



*International Ballroom*

**Moderator:**

Christina I. Tsien, MD, University of Michigan, Ann Arbor, Mich.

**Speakers:**

- **Tumor Response**

Cynthia Menard, MD, Princess Margaret Hospital, Toronto, Ontario, Canada

- **Normal Tissue Imaging**

Lawrence Marks, MD, University of North Carolina, Chapel Hill, N.C.

- **Views of the Future**

Christina I. Tsien, MD, University of Michigan, Ann Arbor, Mich.

**Abstract Presentations:**

- **7: CT Tumoral Heterogeneity as a Prognostic Marker in Primary Esophageal Cancer Following Neoadjuvant Chemotherapy**  
Connie Yip
- **8: Pretreatment SUVmax as a Marker for Progression-Free Survival in Stage I NSCLC Treated With SBRT**  
Zachary Horne
- **9: Correlation of Quantitative Diffusion-Weighted and Dynamic Contrast-Enhanced MRI Parameters with NCCN Risk Group, Gleason Score and Maximum Tumor Diameter in Prostate Cancer**  
Mitchell Kamrava

Response of tumors and normal tissues to radiotherapy can be captured through functional imaging. This session will review current evidence regarding imaging responses to radiotherapy; highlight challenges in imaging analysis, interpretation and cross-specialty dialogue; and discuss future opportunities in the era of adaptive radiotherapy treatment planning.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Discuss general trends and issues in imaging response to RT in both tumor and normal tissue.
2. Explain the increasing need for diagnostic radiologists and radiation oncologists to share information regarding the radiation that has been delivered. The newer RT delivery methods (e.g., IMRT) deposit dose in “unexpected places” that might be unintuitive for diagnostic radiologists. Thus, there might be treatment-related effects in places not previously associated with treatment effect, and this need for better communication is increasing.
3. Discuss how functional imaging may potentially change treatment by improved target definition and early intervention in reducing late radiation injury.

**10:00 a.m. – 10:30 a.m.**

**Break**

*Exhibit Hall, Grand Ballroom*

**10:30 a.m. – 12:30 p.m.**

**General Session V: The Role of Biologic Imaging for Evaluating Post-Treatment Response**

*International Ballroom*

**Moderator:**

Suresh K. Mukherji, MD, University of Michigan Health System, Ann Arbor, Mich.

**Speakers:**

- **PET-MR in Oncology**  
Georges El Fakhri, PhD, Massachusetts General Hospital, Boston
- **Post-treatment Evaluation of the CNS**  
Soonmee Cha, MD, UCSF Medical Center, San Francisco
- **Post-treatment MR of the Prostate**  
Mukesh Harisinghani, MD, Massachusetts General Hospital, Boston

**Abstract Presentations:**

- **10: A Phase 2 Multi-institutional Study to Evaluate Gemcitabine and Fractionated Stereotactic Radiotherapy for Unresectable, Locally Advanced Pancreatic Adenocarcinoma**  
Aaron Wild
- **11: Observation Versus Neck Dissection for Residual, PET-Negative Lymphadenopathy After Chemoradiotherapy for Head-and-Neck Cancer**  
Allen Chen
- **12: Diffusion Abnormality Index: A New Imaging Biomarker for Early Assessment of Tumor Response to Therapy**  
Reza Farjam

In addition to reviewing the basics of PET-MR and its potential applications in oncology, this session will explore the use of various magnetic resonance (MR) imaging methods for post-treatment evaluation of CNS tumors. It will also cover the use of multiparametric MRI to identify and localize recurrent prostate cancer and how this information can be used for radiation therapy planning.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Summarize the basics of PET-MR and its role and potential applications in oncology.
2. Discuss varying clinical scenarios, strengths and limitations of state-of-the-art MR imaging methods, and summarize structural and physiologic MRI methods related to post-treatment evaluation of CNS tumors.
3. Define the common sites, imaging appearance, and the role of MRI in recurrent prostate cancer.

**12:30 p.m. – 1:30 p.m.**

**Lunch**

*Exhibit Hall, Grand Ballroom*

**1:30 p.m. – 2:00 p.m.**

**General Session VI: Keynote II – A Critical Evaluation of Methods for Imaging Tumor Hypoxia**  
*International Ballroom*

**Moderator:**

Kevin A. Camphausen, MD, National Cancer Institute, Bethesda, Md.

**Speaker:**

Mark W. Dewhirst, DVM, PhD, Duke University Medical Center, Durham, N.C.

This lecture will provide a comprehensive overview of the main features of tumor hypoxia and a critical review of methods to image it, keeping in mind the features that are essential to understanding its nature and its influence on tumor biology and treatment resistance.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Discuss primary features of tumor hypoxia.
2. Discuss how various imaging methods can capture features of tumor hypoxia.
3. Explain the clinical importance of imaging tumor hypoxia.

**2:00 p.m. – 4:00 p.m.**

**Breakout Session III (Concurrent): Head and Neck**  
*International Ballroom*

**Moderators:**

Hugh D. Curtin, MD, Massachusetts Eye & Ear Infirmary, Boston

Quynh-Thu Le, MD, Stanford School of Medicine, Stanford, Calif.

#### Speakers:

- **Imaging Landmarks in Head and Neck Cancer**  
Hugh D. Curtin, MD, Massachusetts Eye & Ear Infirmary, Boston
- **Advanced Imaging in Head and Neck Cancer**  
Suresh K. Mukherji, MD, University of Michigan Health System, Ann Arbor, Mich.
- **DCE-MRI for Prognosis and Response Assessment: The Agony and the Ecstasy**  
David Brizel, MD, Duke University School of Medicine, Durham, N.C.
- **Practical Aspects of Using PET-CT in Radiation Treatment Planning**  
Nancy Lee, MD, Memorial Sloan-Kettering Cancer Center, New York

The session will explore the integration of imaging into radiation therapy planning. A discussion of key anatomic landmarks where involvement can change therapy will serve as an introduction. A discussion of the use of advanced imaging techniques in designing therapeutic plans, as well as to predict and follow response, will follow. These techniques will include dynamic CT and MRI as well as various advanced MRI sequences and PET imaging.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Discuss key normal tissue anatomy on cross-sectional imaging studies (CT and MRI).
2. Summarize the current clinical applications of CT perfusion in head and neck oncology.
3. Discuss the challenges and application of DCE MRI in the treatment and prognostication of head and neck cancer.
4. Explain the role of PET-CT imaging in radiation planning and prognostication in head and neck cancer.

**2:00 p.m. – 4:00 p.m.**

**Breakout Session IV (Concurrent): Breast**  
**International Ballroom**



#### Moderators:

Michael A. Cohen, MD, Emory University, Atlanta  
Julia R. White, MD, Ohio State University, Columbus, Ohio

#### Speakers:

- **Breast Tomosynthesis: The Next Real Step in Improving Breast Cancer Screening**  
Elizabeth A. Rafferty, MD, Massachusetts General Hospital, Boston
- **MRI in Patients With Diagnosed Breast Cancer**  
Jennifer Harvey, MD, University of Virginia, Charlottesville, Va.
- **CT-based Treatment Planning: Defining the Target for Radiation Therapy**  
Shannon MacDonald, MD, Massachusetts General Hospital, Boston
- **Case Presentation**  
Michael A. Cohen, MD, Emory University, Atlanta  
Jennifer Harvey, MD, University of Virginia, Charlottesville, Va.  
Shannon MacDonald, MD, Massachusetts General Hospital, Boston  
Elizabeth A. Rafferty, MD, Massachusetts General Hospital, Boston  
Julia R. White, MD, Ohio State University, Columbus, Ohio

Optimal integration of imaging has important implications for all phases of breast cancer management from diagnosis and treatment through follow-up care. This session will focus on three imaging modalities (breast tomosynthesis, MRI and CT) and their respective emerging roles in breast cancer management. The role of breast tomosynthesis in screening and diagnosis of breast cancer will be elucidated. The indications and value of breast MRI once a breast cancer diagnosis is established for determining the extent of disease, response to treatment and surveillance will be examined. Defining CT-based target and normal tissue volumes is integral to radiation delivery. How these vary based on the clinical scenario and treatment method will be reviewed.

*At the conclusion of this activity, the learner will be able to do the following:*

1. Discuss the indications, utility and benefit of tomosynthesis for screening and diagnosis of new breast cancers.
2. Explain the indications, strengths and weaknesses of MRI for breast cancer screening, determining extent of disease and response to treatment relative to other imaging modalities.
3. Define CT-based anatomic target and normal tissue volumes for different breast cancer radiation treatment methods including partial breast, whole breast and post-mastectomy irradiation.

## EXHIBITOR LISTING

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### ACCUBOOST

**Tabletop 3**

1 Industrial Way, Tyngsboro, MA 01879

Phone: 978-649-0007

Fax: 978-649-0077

Website: [www.accuboot.com](http://www.accuboot.com)

AccuBoost is the new design for irradiation of partial breast using real-time image-guided, non-invasive brachytherapy. It is used primarily for breast boost but increasingly for Accelerated Partial Breast Irradiation (APBI). The innovative AccuBoost procedure delivers conformal dose to partial breast, while reducing the skin dose and minimizing unintentional exposure to healthy tissue. Early clinical data shows less toxicity and improved cosmetic outcomes.

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### ACCURAY INC.

**Tabletop 2**

1310 Chesapeake Terrace, Sunnyvale, CA 94089

Phone: 408-716-4600

Fax: 408-716-4620

Website: [www accuray.com](http://www accuray.com)

Accuray Incorporated is the premier radiation oncology company that develops, manufactures and sells personalized innovative treatment solutions that set the standard of care, with the aim of helping patients live longer, better lives.

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### AMERICAN SOCIETY FOR RADIATION ONCOLOGY (ASTRO)

**Tabletop 7**

8280 Willow Oaks Corporate Drive, Suite 500, Fairfax, VA 22031

Email: [education@astro.org](mailto:education@astro.org)

Phone: 1-800-962-7876

Website: [www.astro.org](http://www.astro.org)

ASTRO is dedicated to improving patient care through clinical practice, education, advancement of science and advocacy. Find out more about the organization and its members at [www.astro.org](http://www.astro.org).

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### ANALOGIC CORPORATION

**Tabletop 19**

8 Centennial Drive, Peabody, MA 01960

Phone: 978-326-4000

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### ELSEVIER, INC.

**Tabletop 1**

1600 JFK Boulevard, Suite 1800, Philadelphia, PA 19103

Phone: 212-633-3656

Fax: 215-239-3900

Website: [www.elsevierhealth.com](http://www.elsevierhealth.com)

ELSEVIER is a leading publisher of health science publications, advancing medicine by delivering superior reference information and decision support tools to doctors, nurses, health practitioners and students. With an extensive media spectrum — print, online and handheld, we are able to supply the information you need in the most convenient format.

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### ICAD, INC.

**Tabletop 12**

345 Potrero Avenue, Sunnyvale, CA 94085

Phone: 877-963-8327

Fax: 866-222-3404

Website: [www.xoftinc.com](http://www.xoftinc.com)

iCAD provides advanced image analysis and workflow solutions that enable radiologists to identify more cancer earlier. iCAD offers a range of high-performance, upgradeable CAD solutions for digital mammography, MRI and CT. In 2010, iCAD acquired Xoft, Inc., developer of the Axxent® eBx™ electronic brachytherapy system. Axxent uses non-radioactive miniaturized X-ray tube technology and is FDA-cleared for treatment of early stage breast cancer (IORT and APBI), skin cancer and endometrial cancer.

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### LAP OF AMERICA L.C.

**Tabletop 21**

161 Commerce Road, Suite 3, Boynton Beach, FL 33426

Phone: 561-416-9250

Fax: 561-416-9263

Website: [www.lap-laser.com](http://www.lap-laser.com)

LAP of America L.C. has been delivering state of the art patient alignment laser systems for radiation therapy, nuclear medicine and diagnostic radiology since 1997. Building on a strong tradition of experience in the medical industry LAP of America L.C. has become the world leader in patient alignment laser systems for simulation and treatment room applications.

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### MIM SOFTWARE

**Tabletop 23**

25200 Chagrin Blvd., Suite #200, Cleveland, OH 44122

Phone: 216-455-0600

Fax: 216-455-0601

Website: [www.mimsoftware.com](http://www.mimsoftware.com)

MIM Software provides a comprehensive suite of image fusion, contouring and data management tools to optimize your radiation therapy workflow. Atlas-based contouring creates entire structure sets automatically, and deformable re-contouring saves time when replanning for adaptive therapy. Deformable dose accumulation aids treatment decisions. Additionally, MIM Symphony is a planning system for permanent seed implants with the most powerful combination of tools available for LDR brachytherapy.

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### MIRADA MEDICAL

**Tabletop 11**

999 18th Street, Suite 2025, Denver, CO 80202

Phone: 877-872-2617

Website: [www.mirada-medical.com](http://www.mirada-medical.com)

Mirada Medical develops leading-edge medical imaging analysis applications for nuclear medicine, diagnostic radiology, radiation and medical oncology and neurology. We specialize in comprehensive and quantifiable analysis for the diagnosis, staging, treatment planning and assessment of treatment response in oncology. At ASTRO, we will be showcasing a range of products including our Mirada XD oncology case analysis and multi-modal fusion platform.

## Tabletop 20

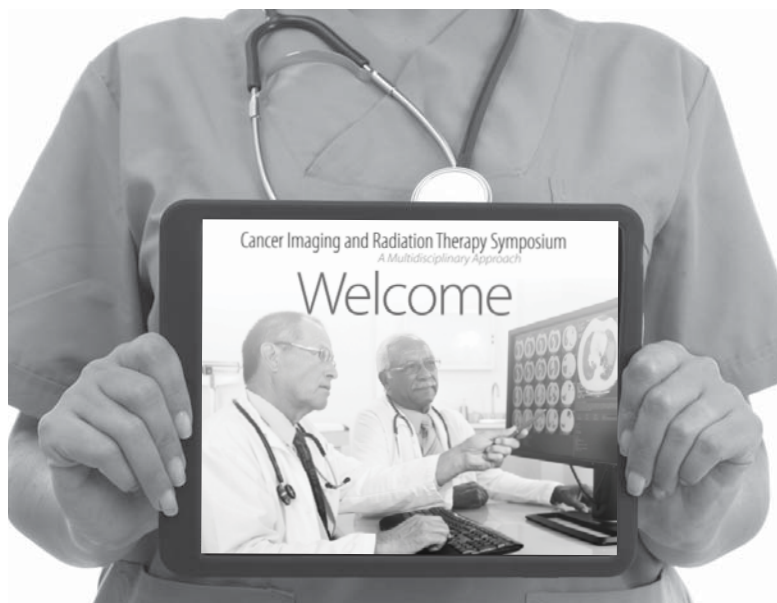
### Tabletop 25

## Tabletop 24

## Tabletop 10

## NOTES

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# Virtual Meeting

Attendee Type	On-site Rates	Post-meeting Rates
Members	\$100	\$200
Residents/Fellows/ Students	\$75	\$150
Nonmembers	\$200	\$400

## Stop by the registration desk and reserve a copy of the Virtual Meeting!

With the Virtual Meeting, you will receive streaming content that has been digitally recorded live and published as audio synchronized to speaker presentations. All of the recorded keynote lectures, compelling expert presentations\* and meeting information will be accessible to you online 24/7 through the ASTRO website. These recorded sessions provide an excellent informational recap and are a great training tool for continual learning.

Those who purchase the Virtual Meeting during registration will receive an email with a link to the recorded presentations approximately three weeks after the conclusion of the meeting.

\*As released for inclusion by the presenters.

AMERICAN SOCIETY FOR RADIATION ONCOLOGY

# meetings2013

STAY ON TOP OF WHAT'S NEW IN CANCER CARE

## Spring Refresher Course

**March 22-24, 2013**

JW Marriott Chicago | Chicago

## Advocacy Day

**April 29-30, 2013**

Washington Marriott | Washington

## State of the Art Techniques Symposium

**May 17-19, 2013**

San Antonio Marriott Rivercenter | San Antonio

## ASTRO/AAPM/NCI Workshop:

*Technology for Innovation in Radiation Oncology*

**June 13-14, 2013**

NIH Campus | Bethesda, Md.

## ASTRO's 55th Annual Meeting

**September 22-25, 2013**

Georgia World Congress Center | Atlanta

## Best of ASTRO

**November 8-9, 2013**

Hilton Bayfront San Diego | San Diego

**ASTRO**  
TARGETING CANCER CARE

[www.astro.org](http://www.astro.org)

The logo features the word "ASTRO" in a white, serif, all-caps font. A stylized white symbol, resembling a crosshair or a target, is positioned to the left of the letter "A".

ASTRO

[www.astro.org](http://www.astro.org)

**AMERICAN SOCIETY FOR RADIATION ONCOLOGY**

8280 WILLOW OAKS CORPORATE DRIVE, SUITE 500  
FAIRFAX, VA 22031