

# Medical Physics Alumni Newsletter

## Medical Physics Graduate Program

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**Betsy Kindred**  
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**FROM THE PROGRAM DIRECTOR****RICHARD E. WENDT, III, PhD, PROFESSOR, DEPARTMENT OF IMAGING PHYSICS**

The past year has been a successful one for our students and faculty, as you will read in the rest of this newsletter.

My only regret for this past year is our inability until recently to thank the donors to The Shalek Fund. There are a variety of excuses that I could make, but the bottom line is that we will do better in the future to obtain timely information from the MD Anderson Development Office and to express our gratitude immediately. I apologize to everyone who has been treated rudely. The Program is truly grateful for your support.



The University of Texas Graduate School of Biomedical Sciences at Houston celebrated its fiftieth anniversary this year. The Medical Physics Program is the second largest program in the graduate school. Yet again this year, we attracted an outstanding pool of applicants for the entering class of 2014.

We will have eight students enter the Ph.D. program and three enter the S.M.S. program in August. They are among the highest ranked of all of the applicants to the graduate school. Four of the Ph.D. matriculants are already studying here in Houston, having joined the 2014 Howard Hughes Medical Institute Med-Into-Grad Program, which started this past May.

On their own initiative, our students have reviewed the Program's curriculum and proposed a number of improvements. A faculty committee has been formed to review the curriculum from the faculty's perspective and to work with our students to improve it. We will be seeking the input and advice of our alumni as part of this process. The pressures that affect many of your practices are also being felt in academia. We are challenged to be more efficient and effective while doing better than ever. I expect that both our students and faculty will rise to that challenge.

The support that the Program receives from the Shalek Fund is essential to our students' educations. We were able to offer three competitive fellowships to our incoming S.M.S. students this year. Because of a new federal law, these fellowships now must include health insurance. The Shalek funds have provided bridge funding to six Ph.D. students whose advisors were between grants or who needed another month or two to finish up their work or to transition to residencies or fellowships.

The changes in our field with respect to education and training have re-ignited our effort to establish a Doctor of Medical Physics program for students seeking a strong clinical focus. The DMP program would concatenate didactic education and clinical experience in order to qualify its graduates to take the American Board of Radiology certifying examinations. Many details remain to be worked out and approvals to be obtained before we can admit our first class, but we are making progress. One of the greatest challenges is to make the program financially viable within our institutional constraints.

Continued on Next Page

**26<sup>th</sup> Annual MD Anderson  
Alumni Luncheon**

**Austin Convention Center**  
**Date: Tuesday, July 22, 2014**  
**Time: 12:15 – 1:45 PM**  
**Location: Ballroom B**



CONTINUED,

FROM THE PROGRAM DIRECTOR

**RICHARD E. WENDT, III, PhD, PROFESSOR, DEPARTMENT OF IMAGING PHYSICS**

I thank Ed Jackson, my predecessor as Program Director, Georgeanne Moore, our past Program Manager, and Gloria Mendoza, our past program assistant, all of whom left the Program over the past year, yet continued to give us their ongoing support. Their help ranged from reminding us of where particular documents were filed to sage advice for how to handle specific challenges to lending a sympathetic ear when matters just needed to be talked through.

Betsy Kindred came to us a year ago with experience managing another GSBS program. She hit the ground running and has not stopped running since. I am extraordinary grateful to Betsy for keeping the ship on an even keel, even when the seas get choppy. Without her careful attention to detail, our educational programs would have ground to a halt. Our students – past, present and future – and our faculty rely on her as the fount of information and advice.

An educational program is ultimately distinguished by its alumni. I am constantly reminded of the reach and excellence of our program as I encounter you, our alumni, in every aspect of our profession.

I hope to see many of you at the AAPM meeting in Austin in July.

BUD WENDT  
rwendt@mdanderson.org  
713-745-3250

## NEW PROGRAM FACULTY & ASSOCIATES

We are happy to report that the following faculty and program associate members have recently joined our program.



**Arvind Rao, PhD**  
Assistant Professor  
Bioinformatics &  
Computational Biology



**Richard Bouchard, PhD**  
Assistant Professor  
Imaging Physics



**Gabriel Sawakuchi, PhD**  
Assistant Professor  
Radiation Physics



**Sang Hyun Cho, PhD**  
Professor  
Radiation Physics



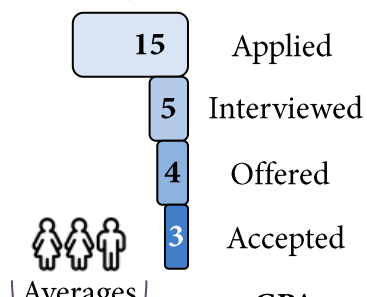
**Konstantin Sokolov, PhD**  
Professor  
Imaging Physics

## Summer 2014 Special Project Course “Proton Therapy Physics” - Taught by Narayan Sahoo, PhD



## AY 2014-15 ADMISSIONS DATA

## SMS Program



3.62

Undergraduate

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Graduate

GRE

154

Verbal

158

Quantitative

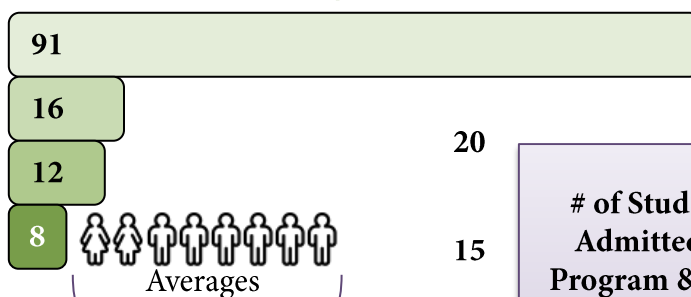
4

Analytical

311

Verbal + Quantitative

## PhD Program



3.59

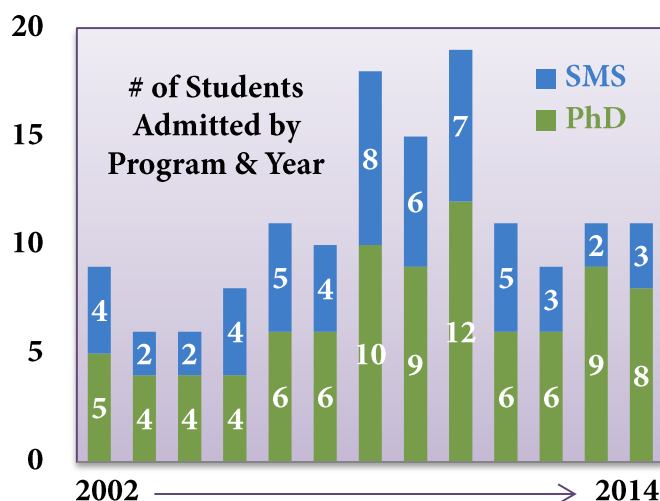
3.96

159

162

4

321



PhD Incoming Class	Undergraduate / Graduate Institution
Fahed Alsanea	Virginia Commonwealth University / Purdue University
Carlos Cardenas	University of Alabama at Huntsville / East Carolina University
David Flint	Carlton University
Rachel Ger	Univ. of North Carolina-Chapel Hill
Kelly Kisling	Georgia Tech / Univ. of Texas GSBS-Houston
Joseph Meier	University of Dallas
Trevor Mitcham	Rice University
Travis Salzillo	Tarleton State University

SMS Incoming Class	Undergraduate Institution
Daniela Branco	Wright State University
Harlee Harrison	University of Mississippi
Joseph Weygand	Columbia University



# of Matriculated Students Since 2002

SMS = 55 PhD = 89

CONGRATULATIONS 2014 GRADUATES!

Katherine Dextraze  
Olivia Huang  
Elizabeth McKenzie  
James Neihart  
Christopher Pham  
Matt Wait

SMS Program

John Eley  
Kenny Homann  
Ryan Bosca  
Jason Matney  
Jongmin Cho  
Adam Yock  
Sarah Joy Castillo  
Joey Cheung

PhD Program

## STUDENT HONORS &amp; AWARDS

**Hua Ai**

Mentor: Tinsu Pan, PhD

- MD Anderson Alumni & Faculty Association Award in Clinical Research, 2<sup>nd</sup> Place, Trainee Research Day 2014 Poster Competition

**Lawrence Bronk**

Mentor: David Grosshans, MD, PhD

- Thomas F. Burks Scholarship, UT-HSC at Houston
- Rosalie B. Hite Fellowship, 2014-2015, GSBS

**Katherine Dextraze**

Mentor: Richard Bouchard, PhD

- Distinguished Student Presenter, 2nd Place, Medical Physics Summer Research Retreat, MD Anderson
- Fellowship, 2013 Howard Hughes Medical Institute, Med-Into-Grad Summer Program, Rice/MD Anderson
- Recognition of Student Leadership, Student Intercouncil, UT-HSC at Houston
- Julia Jones Matthews Scholar Award, Cancer Prevention Research Institute of Texas, MD Anderson

**Samuel Fahrenholtz**

Mentor: Jason Stafford, PhD

- GSBS Student Travel Award

**David Fried**

Mentor: Laurence Court, PhD

- American Legion Auxiliary Fellowship
- Southwest AAPM Young Investigator Symposium, 1st Place
- Sylvan Rodriguez Foundation Scholarship honoring Dr. George Stancel, GSBS

**Joshua Gray**

First Year Student

- Fellowship, 2013 Howard Hughes Medical Institute, Med-Into-Grad Summer Program, Rice/MD Anderson

**Shane Krafft**

Mentor: Mary Martel, PhD

- Rosalie B. Hite Fellowship, 2014-2015, GSBS

**Sara Loupot**

First Year Student

- Fellowship, 2013 Howard Hughes Medical Institute, Med-Into-Grad Summer Program, Rice/MD Anderson
- GSBS Student Travel Award

**Chris McLellan**

Mentor: Jason Stafford, PhD

- TL1 Fellowship, Center for Clinical and Translational Sciences, GSBS

**Drew Mitchell**

First Year Student

- Fellowship, 2013 Howard Hughes Medical Institute, Med-Into-Grad Summer Program, Rice/MD Anderson

**Joshua Niedzielski**

Mentor: Laurence Court, PhD

- Andrew Sowell-Wade Huggins Scholarship in Cancer Research, GSBS

**Jessica Nute**

Mentor: Dianna Cody, PhD

- Best Science Presentation, 2nd Place, John P. McGovern Award for Presentation Skills, GSBS

**Daniel Robertson**

Mentor: Sam Beddar, PhD

- Presidents' Research Scholarship, GSBS

**Angela Steinmann**

First Year Student

- Fellowship, 2013 Howard Hughes Medical Institute, Med-Into-Grad Summer Program, Rice/MD Anderson

**Landon Wootton**

Mentor: Sam Beddar, PhD

- American Legion Auxiliary Fellowship, GSBS

**Adam Yock**

Mentor: Laurence Court, PhD

- American Legion Auxiliary Fellowship, GSBS

**SMS Alumni Are New ABR Diplomates**

Congratulations to our SMS alumni who completed their ABR Certification in Diagnostic Medical Physics this year: Triston Dougall MS, Katie Hulme, MS, Brad Lofton, MS, Adam Springer, MS, and David Zamora, MS.



The Robert J. Shalek Fellowship Fund is used specifically for the support of the medical physics educational programs, and is used in conjunction with other funds to support current fellowships. Donations to this fund also support the long-term goal of providing continuous funding for the fellowships.

### SHALEK FELLOWSHIP RECIPIENTS BY YEAR

#### Robert J. Shalek



#### 2014

- Daniela Branco
- Harlee Harrison
- Joseph Weygand

#### 2013

- Mattie McInnis
- Olivia Popnoe

#### 2012

- Ming Jung Hsieh
- Jennifer Sierra Irwin
- Dana Lewis
- Justin Mikell

#### 2011

- Shuaiping Ge
- Annelise Giebler
- Olivia Huang
- Elizabeth McKenzie
- James Neihart
- Matthew Wait

#### 2010

- Jennelle Bergene
- Kevin Casey
- Jared Ohrt
- Kevin Vredevoogd

#### 2009

- Sarah Joy
- Emily Neubauer
- Paige Summers
- Jackie Tonigan

#### 2008

- Joseph Dick
- James Kerns

#### 2007

- Triston Dougall
- Georgi Georgiev
- Ryan Grant
- Malcolm Heard
- Katie West

#### 2006

- Maria Bellon
- Jimmy Jones
- Nathan Pung
- Yevgeny Vinogradskiy

#### 2005

- Renee Dickinson
- Susannah Lazar
- Alanna McDermott
- Paige Nitsch

#### 2004

- Michael Bligh
- Ryan Hecox
- Hilary Voss

#### 2003

- Blake Cannon
- Scott Davidson

#### 2002

- Earl Gates
- Kenneth Homann
- Hilary Voss
- Claire Nerbun

#### 2001

- Melinda Chi
- Gary Fisher
- Kelly Kisling
- Jackeline Santiago
- David Zamora

#### 2000

- Michael Beach

#### 1999

- Laura Butler
- Amanda Davis
- Nicholas Koch
- Jennifer O'Daniel
- Nicholas Zacharopoulos

#### 1998

- Shannon Bragg-Sitton
- Christopher Cherry
- Dee-Ann Radford

#### 1997

- Christopher Baird
- Aaron Blanchard
- Michael Lemacks
- Luke McLemore

#### 1996

- Michael Bieda

- Tamara Duckworth
- Gwendolyn Myron

#### 1995

- Jonathan Dugan
- Teresa Fischer
- Russell Tarver

#### 1994

- Victor Howard
- Usman Qazi
- Donna Reeve
- Steve Thompson
- Matthew Vossler

#### 1993

- Kyle Antes
- Sarah Danielson
- Dena McCowan
- Donna Reeve
- Matthew Vossler

#### 1992

- Peter Balter
- Kay Jones

#### 1991

- John Bayouth
- Robert Praeder
- Twyla Willoughby

#### 1990

- Maria Graves
- John Wallace

#### 1989

- Mike Gazda
- Scott Jones

Selection of Shalek fellows is the responsibility of the Medical Physics Program Steering Committee.

From 1987 to 2014, 90 Shalek Fellowships have been awarded.

## TRAINEES PRESENTING AT AAPM

**Sunday, July 20, 2014**

**Safety & Novel QA Systems  
1:00PM - 1:55PM Ballroom D**

SU-C-BRD-6 **Landon Wootton**, Results From a 5 Patient in Vivo Rectal Wall Dosimetry Study Using Plastic Scintillation Detectors

**Nuclear Medicine Imaging  
1:00PM - 1:55PM Room: 9A**

SU-C-9A-4 **Wendy Siman**, Alternative Analytic Solution to the Paralyzable Detector Model to Calculate Deadtime and Deadtime Loss

**MR-Guided RT  
1:00PM - 1:55PM Room: 17A**

SU-C-17A-2 **Tze Lim**, Sirius MRI Markers for Prostate Post-Implant Assessment: MR Protocol Development

**Image Registration & Segmentation  
1:00PM - 1:55PM Room: 18A**

SU-C-18A-2 **Scott Ingram**, Image-Based Camera Tracking: Towards Registration of Endoscopic Video to CT

**Multi-Modality/PET  
2:05PM - 3:00PM Room: 9A**

SU-D-9A-5 **Xenia Fave & David Fried**, IBEX: An Open Software Infrastructure Platform to Accelerate Collaborative Work On Quantitative Image Features and Predictive Models

**Imaging General Poster Discussion  
3:00PM - 6:00PM Exhibit Hall**

SU-E-I-20 **Wendy Siman**, Dead Time Count Loss Compensation in SPECT/CT: Projection Versus Global Correction

SU-E-I-26 **Trevor Mitcham**, Development and Characterization of a Temporally Stable Tissue-Mimicking Photoacoustic-Ultrasonic Phantom

**Therapy General Poster Discussion  
3:00PM - 6:00PM Exhibit Hall**

SU-E-J-82 **Kai Lou**, Intra-Fraction Proton Beam-Range Verification with PET Imaging: Feasibility Studies with Monte Carlo Simulations and Statistical Modeling

SU-E-J-161 **Samuel Fahrenholtz**, Inverse Problems for Optical Parameters in Laser Induced Thermal Therapy

**Sunday, July 20, 2014, Continued**

SU-E-J-180 **Christopher MacLellan**, Monitoring Thermochemical Ablation Using Fast Chemical Shift Magnetic Resonance Imaging

SU-E-J-186 **Xenia Fave**, Acquiring and Assessing Upright CBCT Images for Future Treatment Planning

**Quantitative Imaging General Poster Discussion  
3:00PM - 6:00PM Exhibit Hall**

SU-E-QI-5 **Yao Ding**, Denoising Intravoxel Incoherent Motion Magnetic Resonance Images Using Non-Local Mean Technique for Oropharyngeal Cancer Study

SU-E-QI-10 **Joshua Yung**, Intravoxel Incoherent Motion Imaging for MR-Guided Cryoablation

SU-E-QI-18 **Ryan Bosca**, QUATTRO: An Open-Source Software Package for Quantitative Imaging Applications in Assessing Treatment Response

**Therapy Campus Poster  
3:00PM - 6:00PM Exhibit Hall**

SU-E-CAMPUS-T-3 **Dana Lewis**, Development and Implementation of An Anthropomorphic Pediatric Spine Phantom for the Assessment of Craniospinal Irradiation Procedures in Proton Therapy

**Therapy General Poster Discussion  
3:00PM - 6:00PM Exhibit Hall**

SU-E-T-47 **Chris Peeler & Lawrence Bronk**, Application of the Repair-Misrepair-Fixation RBE Model to Describe the Results of High Resolution Proton Irradiation Cell Survival Experiments

SU-E-T-87 **Austin Faught**, Comparison Study of Dose Reconstruction From Cylindrical Diode Array Measurements, with TLD Measurements and Treatment Planning System Calculations in Anthropomorphic Head, Neck and Lung Phantoms

SU-E-T-110 **Austin Faught**, Development of An Independent, Monte Carlo, Dose Calculation, Quality Assurance Tool for Clinical Trials

SU-E-T-167 **Austin Faught**, Evaluation of Mobius Dose Calculation Engine Using Out of the Box Preconfigured Beam Data

SU-E-T-192 **Jacqueline Tonigan**, FMEA Severity Scores - Do We Really Know?

## TRAINEES PRESENTING AT AAPM

### Sunday, July 20, 2014, Continued

#### Therapy General Poster Discussion 3:00PM - 6:00PM Exhibit Hall

SU-E-T-193 **Daniel Robertson**, Form-Fitting Cloth as a Source of Beta Particle Irradiation

SU-E-T-230 **Mitchell Carroll**, Measurement of Proton-Activated Positron Emission with PRESAGE 3-D Dosimeters

SU-E-T-231 **Jongmin Cho**, Measurements of Gold Nanoparticle-Mediated Proton Dose Enhancement Due to Particle-Induced X-Ray Emission and Activation Products Using Radiochromic Films and CdTe Detector

SU-E-T-272, **Hua Ai**, Radiation Damage Comparison Between Intensity Modulated Radiotherapy and Field-In-Field Technique in Breast Cancer Treatments

SU-E-T-273 **Mindy Hsieh**, Radiation Shielding for a Fixed Horizontal-Beam Linac in a Shipping Container and a Conventional Treatment Vault

SU-E-T-320 **Daniel Smith**, The Effect of Surviving Perturbation On the Radiation Response of Breast Cancer Cell Lines

SU-E-T-347 **Hannah Lee**, Validation of the Condensed History Algorithm of Geant4 Using the Fano Test

SU-E-T-368 **David Flint**, Effect of a Strong Magnetic Field On Select Radiation Dosimeters

SU-E-T-463 **Rachel McCarroll & Ashley Rubinstein**, Quantification of Rotational Variation in Mouse Setup for IGRT

SU-E-T-471 **James Kerns**, Small Field Jaw/MLC Reference Data

SU-E-T-535 **Ryan Grant Lafratta**, Preliminary 2D and 3D Gamma Calculation Comparison Using PRESAGE

#### Brachytherapy Planning & Dose Calculation 4:00PM - 6:00PM Room: 19A

SU-F-19A-1 **Sara Loupot**, APBI Brachytherapy Treatment Planning: The Impact of Heterogeneous Dose Calculations

#### Photon Therapy Planning & Dose Calculation 4:00PM - 6:00PM Ballroom D

### Sunday, July 20, 2014, Continued

SU-F-BRD-14 **Joshua Niedzielski**, The Effect of Radiation-Induced Esophageal Swelling On Dose-Volume Histograms

#### Dose Measurement Tools & QA 4:00PM - 6:00PM Ballroom E

SU-F-BRE-6 **Austin Faught**, Evaluation of Patient CT Dose Reconstruction From 3D Diode Array Measurements Using Anthropomorphic Phantoms

### Monday, July 21, 2014

#### John R. Cameron Young Investigator Symposium 7:30AM - 9:30AM Ballroom D

MO-A-BRD-4 **David Fried**, Prognostic Value and Reproducibility of Pretreatment CT Texture Features in Stage III Non-Small Cell Lung Cancer

#### DIR & Dose Impact 10:15AM - 12:15PM Room: 17A

MO-C-17A-4 **Adam Yock**, Forecasting Longitudinal Changes in Oropharyngeal Tumor Morphology Throughout the Course of Head and Neck Radiation Therapy

#### Patient Safety & Quality Improvement 4:30PM - 6:00PM Ballroom E

MO-G-BRE-2 **Kiley Pulliam & James Kerns**, A Survey of IMRT QA Practices for More Than 800 Institutions

#### Physics of Cancer 2 4:30PM - 6:00PM Ballroom F

MO-G-BRF-9 **Ashley Rubinstein**, Investigating Magnetic Field Dose Effects in Mice: A Monte Carlo Study

#### Nuclear Medicine Imaging 4:30PM - 6:00PM Room: 17A

MO-G-17A-1 **Kai Lou**, Innovative High-Performance PET Imaging System for Preclinical Imaging and Translational Researches

MO-G-17A-3 **Hua Ai**, MR-Based Cortical Bone Segmentation for PET Attenuation Correction with a Non-UTE 3D Fast GRE Sequence



## TRAINEES PRESENTING AT AAPM

### Monday, July 21, 2014, Continued

MO-G-17A-5 **Majid Valiollahzadeh**, PET Image Deblurring Using Adaptive Dictionary Learning

MO-G-17A-6 **Justin Mikell & Wendy Siman**, Kernel Based Dosimetry for 90Y Microsphere Liver Therapy Using 90Y Bremsstrahlung SPECT/CT

**MRI: Acquisition Physics & QA**  
4:30PM - 6:00PM Room: 18C

MO-G-18C-6 **Guang Li & Cristina Dodge**, MRI QC: Effects of Multi-Channel Coil Element Failure On Image Quality

### Tuesday, July 22, 2014

**Optical, Ultrasound, & Emerging Imaging Techniques**  
7:30AM - 9:30AM Room: 9A

TU-A-9A-4, **Katherine Dextraze, Christopher MacLellan & Trevor Mitcham**, 8:00 AM, Development of a Thermally Stable Phantom for Photoacoustic and Magnetic Resonance Temperature Imaging

**X-Ray & CT**  
7:30AM - 9:30AM Room: 12A

TU-A-12A-3 **Xenia Fave & David Fried**, Monitoring Changes in Tumor Texture Features On Weekly CT and CBCT Scans of NSCLC Patients

**KEYNOTE SESSION: Photon Therapy Treatment Delivery & Verification**  
10:15AM - 12:15PM Ballroom E

TU-C-BRE-3 **James Kerns**, 10:45 AM, Aggregation of Linac Measurement Data

TU-C-BRE-9, **Elizabeth McKenzie**, 11:45 AM, Performance Comparisons of Patient Specific IMRT QA Methodologies Using ROC Analysis

**MR & Multimodality**  
10:15 - 12:15PM Room 12A

TU-C-12A-2 **Ryan Bosca**, 10:25 AM, Development of a Multiparametric Statistical Response Map for Quantitative Imaging

### 26<sup>th</sup> Annual MD Anderson Alumni Luncheon

Time: 12:15 - 1:45 PM

Location: Ballroom B

### Tuesday, July 22, 2014, Continued

**Multi-Energy CT**  
4:30PM - 6:00PM Room: 18A

TU-F-18A-1 **Jessica Nute & Megan Jacobsen**, Preliminary Results of a Prototype Quality Control Process for Spectral CT

### Wednesday, July 23, 2014

**Brachytherapy Techniques**  
7:30AM - 9:30AM Room: 17A

WE-A-17A-7 **Justin Mikell**, Evaluation of a Grid-Based Boltzmann Solver for Nuclear Medicine Voxel-Based Dose Calculations

**CT Image Quality**  
11:00AM - 12:15PM Room: 18A

WE-D-18A-1 **Jessie Huang, Jessica Nute & James Kerns**, Evaluation of Three Commercial Metal Artifact Reduction Methods for CT Simulations in Radiation Therapy Treatment Planning

WE-D-18A-4 **Cristina Dodge**, How Iterative Reconstruction Algorithms Affect the MTFs of Variable-Contrast Targets in CT Images

**Biological Effect & Outcome Modeling**  
11:00AM - 12:15PM Ballroom E

WE-D-BRE-6 **Joshua Niedzielski**, Quantification of Dose-Response for High Grade Esophagitis Patients Using a Novel Voxel-To-Voxel Method

**Pre-Clinical Radiobiology & Imaging Studies**  
1:45PM - 3:45PM Ballroom E

WE-E-BRE-7 **Lawrence Bronk**, High-Throughput Mapping of Proton Biologic Effect

### Thursday, July 24, 2014

**Cone-Beam CT**  
7:30AM - 9:30AM Room: 18C

TH-A-18C-8 **Rachael Martin**, Design of a Small Animal Contrast Enhanced Dual Energy CT

**Monte Carlo & GPU Techniques for Proton Therapy Dose Calculation**, 7:30AM - 9:30AM Room: 19A

TH-A-19A-5 **Chris Peeler**, 8:10 AM, Modeling Physics Properties and Biologic Effects Induced by Proton and Helium Ions

## TRAINEES PRESENTING AT AAPM

Thursday, July 24, 2014, Continued

TH-A-19A-7 **Lawrence Bronk**, 8:30 AM, The Effect of Particle Tracking Step Size Limit On Monte Carlo-Computed LET Spectrum of Therapeutic Proton Beams

### Particle Therapy Planning & Robustness Evaluation 10:15AM - 12:15PM Ballroom D

TH-C-BRD-8 **Jason Matney**, 11:25 AM, Reducing the Effect of Respiratory Motion On the Delivered Dose in Proton Therapy Through Proper Field Angle Selection

TU-C-BRE-9 **Elizabeth McKenzie**, 11:45 AM, Performance Comparisons of Patient Specific IMRT QA Methodologies Using ROC Analysis

### Imaging for Respiratory Motion 1:00PM - 2:50PM Room: 17A

TH-E-17A-1 **Daniel Robertson**, 1:00 PM, Internal Respiratory Surrogate for 4D CT Using Fourier Transform and Anatomical Features

TH-E-17A-7 **Sarah Castillo**, 2:00 PM, Improved Cine Four-Dimensional Computed Tomography (4D CT) Acquisition and Processing Method

### Treatment Response Assessment 1:00PM - 2:50PM Ballroom F

TH-E-BRF-4 **Shane Krafft**, Characterizing the Response of Texture-Based CT Image Features for Quantification of Radiation-Induced Normal Lung Damage

### FROM THE WORK OF HUA “ASHER” AI



Simulated for PET/MR

**Left:** CT-based attenuation images

**Middle:** Modified CT images simulating soft-tissue MR-based attenuation images for PET attenuation correction

**Right:** Modified CT images simulating MR-based PET attenuation images with segmented bone assigned with single attenuation coefficient

## 2013-2014 STUDENT UPDATE BY CHRISTOPHER PEELER



The 2013 Student Research Retreat was held on July 24, 2013 with Dr. Robert Jeraj from the University of Wisconsin serving as the guest facilitator. Dr. Jeraj gave a thought provoking presentation on the future outlook of research in medical physics and challenged the students to consider how education and research can adapt to the ever changing environment of the field.

A presentation competition was held, and the winners as determined by their ratings from the student body were as follows:

- 1<sup>st</sup> Place – Jessica Nute
- 2<sup>nd</sup> Place – Katherine Dextraze
- 3<sup>rd</sup> Place – Christopher Walker

As a result of the discussion with Dr. Jeraj, the student body decided to continue the discussion by working with the University of Wisconsin medical physics students to organize a joint student meeting at the 2013 AAPM annual meeting.

Topics discussed at the meeting included the design of PhD programs with the advent of the DMP, the promotion of collaborative research between the various specialties within medical physics, and the value of increasing awareness of medical physics at the high school and undergraduate levels.

A report of this meeting was provided to Dr. Jeraj for consideration by the AAPM Working Group FUTURE.

This year the student body was given the opportunity to play a large role in the new student orientation. Current students from various areas of research provided presentations to the newly admitted students in order to introduce them to the plethora of research opportunities available at MD Anderson. These presentations also served as recruiting tools to help the faculty find students for research tutorials. Feedback from the new students indicated that this was an incredibly valuable component of the orientation process.

Continued on Next Page

## 2013-2014 STUDENT UPDATE, CONTINUED

For the second year, the student body voted to determine a recipient of the Outstanding Teaching Award. The award is meant to recognize a faculty member whose commitment to education has served to positively impact the students' experience in the medical physics program.

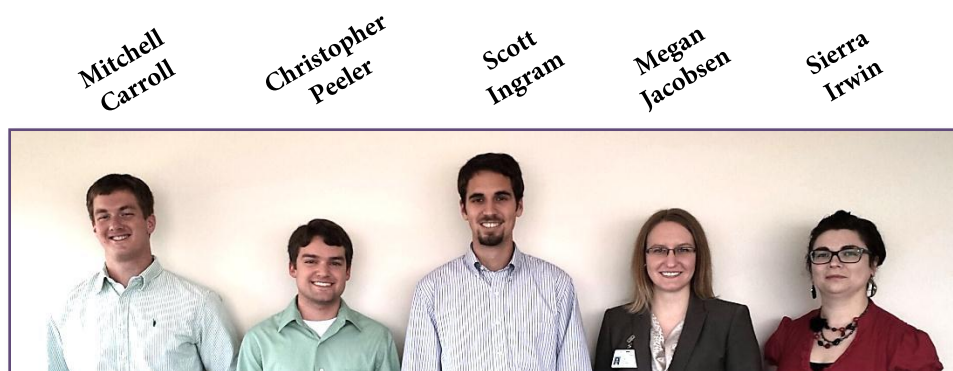
Richard E. Wendt, III, PhD was the recipient of this year's award. Students highlighted Dr. Wendt's availability to provide academic assistance and advice whenever it is needed and his ability to present complex topics in a way that is both engaging and understandable to the students.

Voting to determine the members of the 2014-2015 Student Council was held during the spring semester.

The newly elected members are:

- Scott Ingram  
Student-Faculty Liaison
- Katherine Dextraze  
Assistant Student-Faculty Liaison
- Ashley Rubinstein  
Education Representative
- Sara Loupot  
First-Year Representative
- Xenia Fave  
Social Representative

### THANK YOU 2013-2014 STUDENT COUNCIL MEMBERS



I would like to express my sincerest appreciation to the student council and the whole student body for helping to make this a great year for our program, and I look forward to seeing the program's continued success.

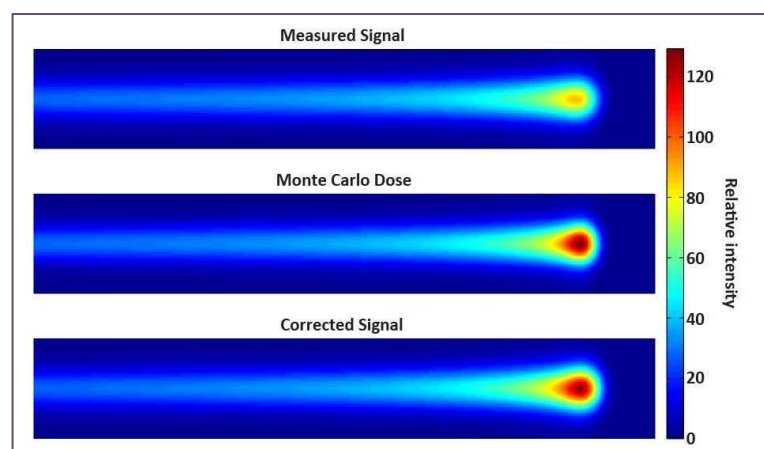
I would also like to thank Betsy Kindred and Lisa Watson for their continual assistance and support and Dr. Wendt for his interest in and support of the feedback and activities of the student body.

CHRISTOPHER PEELER

### FROM THE WORK OF DANIEL ROBERTSON



Experimental setup for proton beam measurements with the scintillator detector.



The measured scintillation signal (top), the dose calculated using Monte Carlo methods (centre), and the corrected scintillation signal (bottom) for a 100.9-MeV proton pencil beam.

## DEPARTMENT OF IMAGING PHYSICS HIGHLIGHTS

### FACULTY HONORS, AWARDS & RECOGNITION

#### Jim Bankson, PhD

- Elevated to the grade of Senior Member, Institute of Electrical and Electronic Engineers (IEEE).

#### Kyle Jones, PhD

- Farrington Daniels Award, AAPM

#### Jason Stafford, PhD

- Appointed as Section Chief of MR & Ultrasound Physics
- Elected Vice President-Elect Society of Thermal Medicine

#### George Starkschall, PhD

- Received the Edith H. Quimby Lifetime Achievement Award, AAPM

### TEACHING EXCELLENCE

The GSBS Curriculum Committee unanimously selected Dr. George Starkschall's "Introduction to Medical Physics I: Basic Interactions" to be the sole recipient of this year's commended course recognition.



### PRESIDENT'S RECOGNITION FOR FACULTY EXCELLENCE



John Hazle, PhD



Osama Mawlawi, PhD

### FACULTY & STAFF - HIRED & PROMOTIONS

**Jim Jacob:** Promoted, Sr. Administrative Assistant

**Caterina Kaffes:** Hired, Imaging Research Technician

**S. Cheenu Kappadath, PhD:** Promoted to Associate Professor

**Kelsey Mathieu, PhD:** Hired as Instructor

**Melissa Ortiz:** Hired, Office Manager

**Jordan Roos:** Hired, Secretary

**Konstantin Sokolov, PhD:** Promoted to Professor

**Marta Taghavi, MS:** Hired, Research Assistant I

**Lisa Watson:** Promoted, Sr. Administrative Assistant

## NEWLY FUNDED GRANTS IN IMAGING PHYSICS

CPRIT RP140021-P05-01 (**Subcontract PI: James Bankson**) 3/1/2014 - 2/29/2016, Total annual costs \$316,148, P5-Novel MRI and MRS Methods for Imaging Cancer Metabolism

DOD PC121749 (**PI: Richard Bouchard**) 2/1/2014 - 1/31/2015, Total costs \$118,498, Photoacoustic and Ultrasonic Image Guided Needle Biopsy of the Prostate

MDACC/GE Healthcare (**PI: Dianna Cody**) 2/1/2013 - 6/30/2014, Total costs \$101,490, Characterization of Calcium and Iron Solutions Using Gemstone Spectral Imaging-CT to Distinguish Between Hemorrhagic and Calcific Lesions

MDACC/GE Healthcare (**PI: Dianna Cody**) 7/1/2013 - 8/31/2015, Total costs \$74,998, Development of an Appropriate QC Program for GSI Imaging

NSF IIP-1312048-01 (**PI: David Fuentes**) 5/1/2013 - 10/31/2014, Total costs \$149,469, Air Option 1: Technology Translation - A Portable Treatment Planning System for MR-Guided Thermal Therapy

NIH P30CA016672-38 (**Core Directors: John Hazle & James Bankson**) 7/1/2013 - 6/30/2018, Direct annual costs \$160,420, Cancer Center Support Grant - Small Animal Imaging Facility. The major goal of this project is to provide small animal imaging resources to regional cancer investigators.



## NEWLY FUNDED GRANTS IN IMAGING PHYSICS, CONTINUED

NIH P30CA016672-38 (**PI: John Hazle**) 11/1/2013 - 6/30/2014, Total direct costs \$30,000, Implementation of Nanomagnetic Relaxometry as a Shared Resource Within the SAIF

Siemens LS2012-00036240LG-03 (**PI: Cheenu Kappadath**) 1/15/2012 - 10/31/2015, Total costs \$273,975, Multimodal Reconstruction and Quantitative SPECT Imaging

NIH R01CA13896-03 (**Subcontract PI: Cheenu Kappadath**) 8/1/2012 - 7/31/2015, Total annual costs \$335,377, A Novel Dose Calculation Method for Targeting Radionuclide Therapy

Sirtex Medical Sirtex Technology (**PI: Cheenu Kappadath**) 2/2/2014 - 2/1/2017, Total annual costs \$51,380, Quest Site Assessment Study

Blanton Davis Ovarian Cancer Research Program/Sprint for Life Research Award (**PI: Kelsey Mathieu**) 2/21/2014, Total costs \$50,000, Early Detection of Ovarian Cancer through Nanomagnetic Relaxometry

Siemens (**PI: Osama Mawlawi**) 9/1/2012 - 8/31/2014, Total costs \$57,231, Evaluate the Potential and Limits of Reducing Scan Time and/or Injected Activity in Multi-Gated Blood Pool (MUGA) Imaging Using IQ SPECT

MDACC/GE Healthcare (**PI: Osama Mawlawi**) 4/29/2013 - 5/28/2015, Total costs \$224,713, 4D PET/CT Imaging in Lung and Colorectal Cancer with Liver Metastasis

MDACC/GE Healthcare (**PI: Osama Mawlawi**) 2/1/2014 - 3/31/2015, Total costs \$90,984, Evaluation of Regularized Image Reconstruction in Whole Body PET/CT Imaging

Radiomedix (**PI: Osama Mawlawi**) 6/6/2014 - 5/29/2016, Total costs \$66,397, Dosimetry for AminoMedix for radiation kidney protection during Peptide-Receptor Radionuclide Therapy (PRRT): Phase I, II Clinical Trial

MDACC/GE Healthcare (**PI: Tinsu Pan**) 2/1/2014 - 3/31/2015, Total costs \$82,366, Optimization of 4D PET/CT  
The specific aims of this research are 1) Develop a tool to mitigate irregular respiration in image correlation of 4D-CT, and 2) Develop a new perspective cine 4D-CT to reduce radiation exposure to the patient

CPRIT RP120326-02 (**PI: Yiping Shao**) 12/1/2011 - 11/30/2014, Total annual costs \$1,271,284, In-Situ PET Imaging for Adaptive Proton Therapy

NIH R01CA138502-05 (**PI: Chris Shaw**) 5/1/2010 - 2/28/2015, Total annual costs \$2,669,451, DTS Imaging with Digitally Addressable X-Ray Source (DAXS)

NIH R01CA158598 (**Subcontract PI: Konstantin Sokolov**) 9/25/2012 - 6/30/2017, Total annual costs \$57,708, Functional Cellular and Molecular Imaging Using Ultrasound-Guided Photoacoustics

NCI R01CA143663-04 (**PI: Konstantin Sokolov**) 1/1/2010 - 12/31/2014, Total annual costs \$1,480,338, Biodegradable Plasmonic Nanoparticles for Cancer Imaging and Therapy

NCI R01CA149740-03 (**Subcontract PI: Konstantin Sokolov**) 7/1/2010 - 3/31/2015, Total annual costs \$118,499, Molecular Photothermal Therapy of Cancer Using Targeted Metal Nanoparticles

NIH R01CA103830-08 (**Subcontract PI: Konstantin Sokolov**) 9/23/2011 - 7/31/2016, Total annual costs \$548,600, Optical Systems for In Vivo Molecular Imaging of Cancer

NCI R01EB008101-07 (**Subcontract PI: Konstantin Sokolov**) 09/01/2007 - 2/29/2016, Total annual costs \$393,260, Acoustic Imaging of Sentinel Node Metastasis using Plasmonic Nanosensors



## NEWLY FUNDED GRANTS IN IMAGING PHYSICS, CONTINUED

NIH R21CA173663-01 (**Subcontract PI: Konstantin Sokolov**) 6/1/2013 - 5/31/2015, Total annual costs \$14,903, Electronically-Connected Plasmonic Metamaterials for Capture and Detection of CTC

MDACC/GE Healthcare (**PI: Jason Stafford**) 5/6/2013 - 5/31/2015, Total costs \$149,591, MRI for Minimally-Invasive Therapy

Gabriel Foundation (**PI: Richard Wendt**) 4/1/2014 - 3/31/2015, Total costs \$31,245, Radiation Safety of Treatment with Liquid Brachytherapy

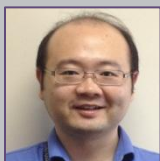
NIH R43CA150601 (**Subcontract PI: Richard Wendt**) 8/1/2013 - 7/31/2015, Total costs \$42,213, A New Radiopharmaceutical for the Treatment of Metastatic Bone Cancer

Isotherapeutics LS2013-00037781JW (**PI: Richard Wendt**) 9/20/2013 - 9/20/2015, Total costs \$10,249, Dosimetry of Beta-Emitting Radionuclides in Various Geometries

## IMAGING PHYSICS RESIDENCY PROGRAM

The CAMPEP-accredited Imaging Physics Residency Program has trained a total of 21 clinical medical physicists, 18 of whom have achieved national board certification.

### Current Residents



**Guang Li, PhD** from The University of Texas Health Science Center at San Antonio joined the program in July 2013 and has completed his 1st year of training.



**Benton Pahlka, PhD** (our first Medical Physics Fellow) from the Fermi National Accelerator Laboratory began a hybrid research and clinical training program with us in March 2014.



**Charles E. Willis  
MS, PhD, FAAPM**

Associate Professor &  
Program Director  
Imaging Physics  
Residency Program

### Future Residents

- Steven Bache, MS from Duke University will begin the program in August 2014
- We are in the process of recruiting two trainees to enter the program in 2015

### Recent Resident Graduates

- Nathan Busse, MS completed the program in August 2013 and is currently working with Colorado Associates in Medical Physics (CAMP) in Colorado
- Leland Page, PhD completed the program in May 2014 and is currently working with Medical & Radiation Physics, Inc. (MARPI) in San Antonio
- Cristina Dodge, MS completed the program in July 2014 and has accepted a position within MD Anderson

### Resident Alumni

Congratulations to our resident alumni who completed their ABR Certification in Diagnostic Medical Physics this year: Nathan Busse, MS, Shannon Fritz, PhD, Elena Tonkopi, MS.

## DEPARTMENT OF RADIATION PHYSICS HIGHLIGHTS

### FACULTY HONORS, AWARDS & RECOGNITION

#### Sam Beddar, PhD

- Reappointed to the GSBS Faculty with Highest Commendation

#### Geoffrey S. Ibbott, PhD

- Elected to Second Term as Secretary-Treasurer of the ABR

#### Rajat Kudchadker, PhD

- Elected 2014 SWAAPM President-Elect

### FACULTY & STAFF – HIRED & PROMOTIONS

- **Christopher Pham, MS** - Hired, Jr. Medical Physicist
- **Yelin Suh, PhD** - Promoted to Assistant Professor
- **Jiafu Tang** - Hired, Physics Assistant
- **Jihong Wang, PhD** - Hired, Associate Professor

### PRESIDENT'S RECOGNITION FOR FACULTY EXCELLENCE



**Radhe Mohan, PhD**



**Marilyn Stovall, PhD**

### MAJOR ACHIEVEMENTS IN RADIATION PHYSICS RESEARCH

**Richard Castillo, PhD**, NIH/NCI - \$478,136, "K01: A Bayesian Framework for Inter-Modality Deformable Image Registration Evaluation"

**Uwe Titt, PhD**, Sister Institution Network Fund Application - \$100,000, "The Future of Particle Therapy: Physics and Biology of Light Ions"

**Stephen Kry, PhD**, Korea Institute of Radiological and Medical Sciences - \$33,216, "The TACO Trial: A Randomized Phase III Clinical Trial of Weekly Versus Tri-Weekly Cisplatin Based Chemoradiation in Locally Advanced Cervical Cancer"

**David Followill, PhD**, NIH/NCI - \$398,090, Supplement to "Radiological Physics Center"

**Rebecca Howell, PhD**, St. Jude's Cancer Research: Childhood Cancer Survivor Study (CCSS) - \$31,842, "Radiation Dose Reconstruction Methods for Intensity Modulated Radiation Therapy"

**Adam Melancon, PhD**, Start-Up Funds - \$200,000, "Biologically Image-Guided Adaptive Radiotherapy: Proof of Concept that Quantitative Imaging of Hypoxia, Proliferation, and Tumor Burden Can be Used to De-escalate Dose While Maintaining Tumor Control"

**Michalis Aristophanous, PhD**, Varian Medical Systems - \$138,244, "Gross to Clinical Target Volume Expansion: A Population to Individual Margin Model"

**Laurence Court, PhD & Peter Balter, PhD**, Varian Medical Systems - \$163,258, "Development of Upright Radiation Therapy Treatments"

**Heng Li, PhD**, Varian Medical Systems - \$160,032, "Minimizing Dose Uncertainty for Spot Scanning Proton Beam of Moving Tumors by Optimization of the Spot Delivery Sequence"

**Jinzhong Yang, PhD**, Varian Medical Systems - \$115,283, "Uncertainty Analysis of Deformable Image Registration for Adaptive Radiotherapy"

## RADIATION PHYSICS FEATURE ARTICLES

### Best Articles: Physics in Medicine & Biology Journal

“Measurement of characteristic prompt gamma rays emitted from oxygen and carbon in tissue-equivalent samples during proton beam irradiation”

Polf JC, Panthi R, Mackin DS, McCleskey M, Saastamoinen A, Roeder BT, Beddar S  
Phys. Med. Biol. 58 5821

### MedicalPhysicsWeb.org Highlighted Article

“Optical artefact characterization and correction in volumetric scintillation dosimetry”

Robertson D, Hui C, Archambault L, Mohan R, Beddar S  
Phys. Med. Biol. 59 23-42

### UroToday.com Feature

Real-time in vivo rectal wall dosimetry using plastic scintillation detectors for patients with prostate cancer, "Beyond the Abstract," by Sam Beddar, PhD, DABR, FCCPM, FAAPM

## RADIATION PHYSICS TRAINEE UPDATES

### Residency Program

Four residents will be completing the program during Summer 2014:

- Kevin Casey, MS
- Xiaoqiang Li, PhD
- Rajesh Pidikiti, PhD
- Michelle Quan, PhD

Four new residents will be joining the program September 1, 2014:

- Tao Han, PhD (Radiation Physics Postdoctoral Fellow)
- Badal Juneja, PhD (University of Florida)
- Dana Lewis (GSBS Medical Physics Program completing MS degree Summer 2014)
- Daniel Robertson (GSBS Medical Physics Program completing PhD Summer 2014)

### Postdoctoral Fellows

Since the last report six postdocs have joined the program:

- Mamdooh Algahtami
- Frank Barnett
- Dirk Bartkoski
- Yuting Li
- Michelle Mathis
- Gustavo Schwencke
- Reeza Taleei

Slade Klawikowski completed the program June 11, 2014.

### Advanced Radiation Physics Fellows

- Joshua Stoker completed the program on March 31, 2014
- John Eley will be completing the program on July 31, 2014

Recruitment for two new proton fellows is in progress.



**Mohammad R. Salehpour**  
PhD, DABR  
Professor & Director  
of Education



**Ronald Zhu, PhD**  
Professor & Director  
Radiation Physics  
Residency Program



**Narayan Sahoo, PhD**  
Professor & Director  
Advanced Radiation  
Physics Fellowship

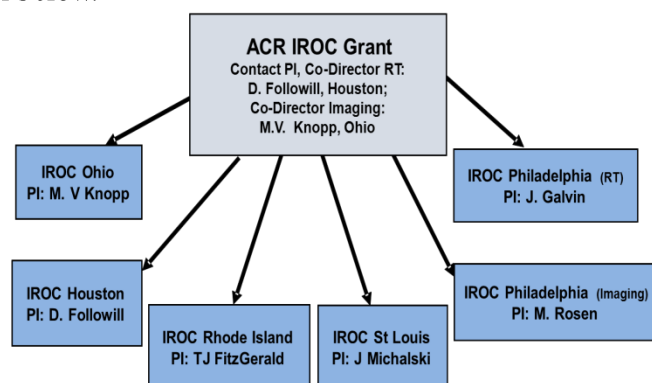
## IMAGING AND RADIATION ONCOLOGY CORE (IROC) COOPERATIVE

The Radiological Physics Center (RPC) grant ended officially on December 31, 2013, but was given an administrative extension until February 28, 2014.

Effective March 1, 2014, the NCI's Cooperative Clinical Trial Program ceased to exist and the new National Clinical Trial Network (NCTN) Program began.

A component of the new NCTN was an Imaging and Radiation Oncology Core service that the former trial QA centers joined to respond to the funding opportunity announcement.

The new organization is called the Imaging and Radiation Oncology Core (IROC) Cooperative. It consists of 6 QA centers as shown below.



A total of 2,020 active institutions are now being monitored, including 46 in Canada, 250 elsewhere in 45 other countries throughout the world. Nearly 3100 IROC Houston phantoms have been shipped and irradiated since we began this program back 2001.

Our experience shows that still about 10-15% of institutions fail to irradiate the phantoms according to their treatment plans.

Since the beginning of the RPC back in 1968, it has performed the following:

- 2,123,067 beams checked w/ TLD/OSLDs
- 1,773 site visits to 829 RT facilities
- 27,517 patient records reviewed
- 3069 phantoms shipped
- 11 of 16 clinically active proton centers approved

To date, IROC Houston has made a total of 17 visits to proton centers and has approved one or more treatment modalities at 11 of the 17 clinically active proton centers for the use in NCI funded clinical trials. We anticipate that 3-5 site visits will occur in 2014.

**Imaging and Radiation Oncology Core (IROC Group) IROC Houston QA Center**, 1 U24 CA180803, American College of Radiology, 3/1/2014-2/28/2015, \$1,100,000/year.

**Advanced Technology Radiation Therapy Quality Assurance Review Consortium**, 2 U24 CA081647, Washington University, 7/1/2007-2/28/2014, \$443,260 (\$77,355/year).

**Veterans Administration, National Medical Physics Peer-Review of Radiation Therapy Quality Assurance Operations**, 9/27/2010-9/26/2014, \$821,118 (\$205,280/year). This contract is anticipated to be renewed for another 3 year period.

**The AIDS Malignancy Clinical Trials Consortium (AMC) Protocol #081: Pilot Study of Safety, Toxicity, and Compliance of Concomitant Chemoradiotherapy for HIV-Associated Locally-Advanced Cervical Cancer**, CA121947, The EMMES Corporation, 7/1/2012-8/31/2015, \$43,657 (\$14,552/year).

**The TACO Trial: A Randomized Phase III clinical trial of weekly versus tri-weekly Cisplatin based chemoradiation in locally advanced cervical cancer**, KIRAMS 50906, 7/1/2013-6/30/2017, \$33,216 (\$8,304/year).

**Supplement to Radiological Physics Center**, CA10953, NIH/NCI, \$398,090, 1/1/2013-12/31/2014. A no cost extension was granted through 12/31/2014.

The funding from Massachusetts General Hospital was granted a no cost extension through May 31, 2014. These funds from MGH/NCI are for the **Development of Standard Operating Procedures for Dosimetry Validation and Accreditation of Proton Therapy Centers**, 4/1/2011-5/31/2014, \$741,775 (\$247,258/year).

**Funded for 45 years, the RPC is one of the longest NCI grants!**

## OTHER PROJECTS WITHIN IROC HOUSTON

RPC staff and students are presenting their work on the following 24 topics at this AAPM meeting from proton therapy to brachytherapy. Most projects are collaborations with staff or faculty in the Departments of Radiation Physics and Imaging Physics and other IROC QA centers.

1. Imaging and Radiation Oncology Core (IROC) QA Center Organization and Core Services
2. Technical Aspects of Credentialing for the NSABP B-51 / RTOG 1304 Trial
3. The Radiological Physics Center (RPC): 45 Years of Improving Radiotherapy Dosimetry
4. Comparison Study of Dose Reconstruction From Cylindrical Diode Array Measurements, with TLD Measurements and Treatment Planning System Calculations in Anthropomorphic Head and Neck and Lung Phantoms
5. Aggregation of Linac Measurement Data
6. Is It Feasible to Tighten the Criteria for IROC's Anthropomorphic Phantoms?
7. Evaluation of Three Commercial Metal Artifact Reduction Methods for CT Simulations in Radiation Therapy Treatment Planning
8. Development and Implementation of an Anthropomorphic Pediatric Spine Phantom for the Assessment of Craniospinal Irradiation Procedures in Proton Therapy
9. Development of An Independent, Monte Carlo, Dose Calculation, Quality Assurance Tool for Clinical Trials
10. Credentialing of IGRT Equipment and Processes for Clinical Trials
11. FMEA Severity Scores - Do We Really Know?
12. Imaging and Radiation Oncology Core (IROC) Houston QA Center (RPC) Credentialing Innovation in Medical Physics
13. Imaging and Radiation Oncology Core (IROC) Houston QA Center (RPC) Credentialing
14. Validation of the Use of OSLD for Carbon Beam Remote Dosimetry
15. A Survey of IMRT QA Practices for More Than 800 Institutions
16. Investigating Magnetic Field Dose Effects in Mice: A Monte Carlo Study
17. Evaluation of Mobius Dose Calculation Engine Using Out of the Box Preconfigured Beam Data
18. Evaluation of Patient CT Dose Reconstruction From 3D Diode Array Measurements Using Anthropomorphic Phantoms
19. Performance Comparisons of Patient Specific IMRT QA Methodologies Using ROC Analysis
20. Uncertainty Analysis for Dose Measurements Using OSLD NanoDots
21. Small Field Jaw/MLC Reference Data
22. Evaluation of the MicroSTAR Reader for the OSLD System for Remote Dosimetry Audits at the IROC
23. Preliminary 2D and 3D Gamma Calculation Comparison Using PRESAGE
24. Comparison Study of Dose Reconstruction from Cylindrical Diode Array Measurements, with TLD Measurements and Treatment Planning System Calculations in Anthropomorphic Head and Neck and Lung Phantoms



## MD ANDERSON FACULTY PRESENTATIONS AAPM 2014

### SUNDAY, JULY 20, 2014

#### **SU-Level 4 Foyer-15**

Southwest Chapter. R Kudchadker, N Papanikolaou, O Zeidan, D Gress, S McCullough, K Antes

#### **SU-A-BRF-1 | 9:30-11:00AM Rm: Ballroom F**

Education Council Symposium: Online Education in Medical Physics. J Dobbins, J Prisciandaro, C Bloch, E Gingold, G Starkschall, M Oldham, P Sprawls, Y Xiao

#### **SU-A-BRF-6 | 9:30-11:00AM Rm: Ballroom F**

Software Tools for Creating Online Content. G Starkschall

#### **SU-C-18A-2 | 1:00-1:55PM Rm: 18A**

Image-Based Camera Tracking: Towards Registration of endoscopic Video to CT. S Ingram, J Yang, B Beadle, A Rao, R Wendt, R Castillo, L Court

#### **Imaging SNAP Oral | Nuclear Medicine Imaging | 1:00-1:55 PM | Room: 9A Moderator, O Mawlawi**

#### **SU-C-9A-4 | 1:00-1:55PM Rm: 9A**

Alternative Analytic Solution to the Paralyzable Detector Model to Calculate Deadtime and Deadtime Loss. W Siman, SC Kappadath

#### **SU-D-12A-4 | 2:05-3:00PM Rm: 12A**

Investigation of a 2D Antiscatter Grid for Flat Panel Detectors. C Altunbas, Y Zhong, C Shaw, B Kavanagh, M Miften

#### **SU-D-18C-3 | 2:05-3:00PM Rm: 18C**

In Vivo MR Imaging Using a Combined Single-Point Dixon and Phase-Sensitive Inversion Recovery Technique. J Son, J Hazle, J Ma

#### **SU-E-T-230 | 3:00-6:00PM Rm: Exhibit Hall**

Measurement of Proton-Activated Positron Emission with PRESAGE 3-D Dosimeters. M Carroll, J Adamovics, O Mawlawi, G Ibbott

#### **SU-E-I-101 | 3:00-6:00PM Rm: Exhibit Hall**

Effects of Gantry Rotation Time on CT Number Accuracy in Single-Source Dual Energy CT Imaging with Fast-kVp Switching. X Liu, D Cody, J Rong

#### **SU-E-CAMPUS-T-6 | 3:00-6:00PM Rm: Exhibit Hall**

Radiochromic Film Analysis Based on Principal Components. R Wendt

#### **SU-E-I-6 | 3:00-6:00PM Rm: Exhibit Hall**

A Robust and Improved Method of Analysis for Dose Calibrator Linearity Data Based On First Principles. D Gress, SC Kappadath

#### **SU-E-I-20 | 3:00-6:00PM Rm: Exhibit Hall**

Dead Time Count Loss Compensation in SPECT/CT: Projection Versus Global Correction. W Siman, SC Kappadath

#### **SU-E-I-26 | 3:00-6:00PM Rm: Exhibit Hall**

Development and Characterization of a Temporally Stable Tissue-Mimicking Photoacoustic-Ultrasonic Phantom. T Mitcham, J Lynch, J Cook, S Emelianov, R Bouchard

### SUNDAY, JULY 20, 2014, CONTINUED

#### **SU-E-I-32 | 3:00-6:00PM Rm: Exhibit Hall**

Improving Vessel Delineation in Brain Using Susceptibility Weighted MRI and Group Sparse Reconstruction. W Stefan, K Hwang, J Hazle, RJ Stafford

#### **SU-E-I-76 | 3:00-6:00PM Rm: Exhibit Hall**

Matching Primary and Scattered X-Ray Spectra for Use in Calculating the Diagnostic Radiation Index of Protection. A Pasciak, A Jones, L Wagner

#### **SU-E-J-82 | 3:00-6:00PM Rm: Exhibit Hall**

Intra-Fraction Proton Beam-Range Verification with PET Imaging: Feasibility Studies with Monte Carlo Simulations and Statistical Modeling. K Lou, D Mirkovic, X Sun, X Zhu, F Poenisch, D Grosshans, J Clark, Y Shao

#### **SU-E-J-161 | 3:00-6:00PM Rm: Exhibit Hall**

Inverse Problems for Optical Parameters in Laser Induced Thermal Therapy. SJ Fahrenholtz, RJ Stafford, DT Fuentes

#### **SU-E-J-197 | 3:00-6:00PM Rm: Exhibit Hall**

A Moving Least Squares Approach for Computing Spatially Accurate Transformations That Satisfy Strict Physiologic Constraints. E Castillo, R Castillo, D Fuentes, T Guerrero

### MONDAY, JULY 21, 2014

#### **MO-A-BRD-4 | 7:30-9:30AM Rm: Ballroom D**

Prognostic Value and Reproducibility of Pretreatment CT Texture Features in Stage III Non-Small Cell Lung Cancer. D Fried, S Tucker, S Zhou, Z Liao, O Mawlawi, G Ibbott, L Court

#### **MO-D-9A-1 | 11:15-12:15PM Rm: 9A**

"Stop Lecturing Me!" New Methods for Teaching Medical Physics. G Starkschall, S Kry, R Howell

#### **MO-D-9A-2 | 11:15am-12:15PM Rm: 9A**

Intro; Flipped Learning 2.0. G Starkschall

#### **MO-E-18A-1 | 1:45-3:45PM Rm: 18A**

Best Practices In Pediatric Imaging. C Willis, K Strauss, R MacDougall, C Sammet

#### **MO-E-18A-2 | 1:45-3:45PM Rm: 18A**

Exposure Factor Control in Pediatric Projection Radiography. C Willis

#### **MO-G-17A-3 | 4:30-6:00PM Rm: 17A**

MR-Based Cortical Bone Segmentation for PET Attenuation Correction with a Non-UTE 3D Fast GRE Sequence. H Ai, K Hwang, T Pan

#### **MO-G-17A-5 | 4:30-6:00PM Rm: 17A**

PET Image Deblurring Using Adaptive Dictionary Learning. S Valiollahzadeh, J Clark, O Mawlawi

#### **MO-G-17A-1 | 4:30-6:00PM Room: 17A**

Innovative High-Performance PET Imaging System for Preclinical Imaging and Translational Researches. X Sun, K Lou, Z Deng, Y Shao

## MD ANDERSON FACULTY PRESENTATIONS AAPM 2014

### MONDAY, JULY 21, 2014, CONTINUED

#### **MO-G-17A-6 | 4:30-6:00PM Rm: 17A**

Kernel Based Dosimetry for 90Y Microsphere Liver Therapy Using 90Y Bremsstrahlung SPECT/CT. J Mikell, W Siman, A Mahvash, F Mourtada, SC Kappadath

#### **MO-G-18A-1 | 4:30-6:00PM Rm: 18A**

Radiation Dose Reducing Strategies in CT, Fluoroscopy and Radiography. M Mahesh, E Gingold, A Jones

#### **MO-G-18A-4 | 4:30-6:00PM Rm: 18A**

Radiation Dose Optimization Strategies in Fluoroscopy. A Jones

#### **MO-G-18C-6 | 4:30-6:00PM Rm: 18C**

MRI QC: Effects of Multi-Channel Coil Element Failure on Image Quality. G Li, C Dodge, D Reeve

#### **MO-G-BRF-9 | 4:30-6:00PM Rm: Ballroom**

Investigating Magnetic Field Dose Effects in Mice: A Monte Carlo Study. A Rubinstein, M Guindani, D Followill, A Melancon, J Hazle, L Court

### TUESDAY, JULY 22, 2014

#### **TU-A-18A-1 | 7:30-9:30A Rm: 18A**

Basic Principles of PET/CT, Calibration Methods and Contrast Recovery Across Multiple Cameras. SC Kappadath, J Nye

#### **TU-A-18A-2 | 7:30-9:30A Rm: 18A**

Principles of PET/CT, Quality Control and Calibration. SC Kappadath

#### **TU-A-9A-4 | 7:30-9:30A Rm: 9A**

Development of a Thermally Stable Phantom for Photoacoustic and Magnetic Resonance Temperature Imaging. K Dextraze, C MacLellan, T Mitcham, M Melancon, R Bouchard

#### **TU-C-12A-2 | 10:15A-12:15P Rm: 12A**

Development of a Multiparametric Statistical Response Map for Quantitative Imaging. R Bosca, A Mahajan, VE Johnson, PD Brown, L Dong, RJ Stafford, EF Jackson

#### **TU-C-BRD-1 | 10:15-11:15A Rm: Ballroom D**

Image Guided SBRT I: Multi-Modality 4D Imaging. J Cai, G Mageras, T Pan

#### **TU-C-BRD-4 | 10:15-11:15A Rm: Ballroom D**

4D PET: Promises and Limitations. T Pan

#### **Nuclear Medicine, Optical, and Ultrasound: Quantitative Imaging Scientific Session | 4:30-6:00 Pm | Room: 12A**

Moderator: O Mawlawi

#### **TU-F-18A-1 | 4:30-6:00P Rm: 18A**

Preliminary Results of a Prototype Quality Control Process for Spectral CT. J Nute, M Jacobsen, J Pennington, A Chandler, Y Imai, C Baiu, D Cody

### WEDNESDAY, JULY 23, 2014

#### **WE-A-17A-7 | 7:30-9:30A Rm: 17A**

Evaluation of a Grid-Based Boltzmann Solver for Nuclear Medicine Voxel-Based Dose Calculations. J Mikell, SC Kappadath, T Wareing, F Mourtada

### WEDNESDAY, JULY 23, 2014, CONTINUED

#### **WE-A-18C-1 | 7:30-9:30A Rm: 18C**

Emerging and Innovative Ultrasound Technology in Diagnosis and Therapy. S Emelianov, A Oraevsky, R Stafford

#### **WE-D-18A-1 | 11:00A-12:15P Rm: 18A**

Evaluation of Three Commercial Metal Artifact Reduction Methods for CT Simulations in Radiation Therapy Treatment Planning. J Huang, J Kerns, J Nute, X Liu, F Stingo, D Followill, D Mirkovic, R Howell, S Kry

#### **WE-D-18A-4 | 11:00A-12:15P Rm: 18A**

How Iterative Reconstruction Algorithms Affect the MTFs of Variable-Contrast Targets in CT Images. CT Dodge, J Rong, CWDodge

#### **WE-E-18A-3 | 1:45-3:45P Rm: 18A**

How Accurately Can the Peak Skin Dose in Fluoroscopy Be Determined Using Indirect Dose Metrics? A Jones, A Pasciak

#### **WE-E-9A-1 | 1:45-3:45P Rm: 9A**

Ultrasound Elasticity. S Emelianov, T Hall, R Bouchard

#### **WE-E-9A-4 | 1:45-3:45P Rm: 9A**

In Depth Methods and Applications of Acoustic Radiation Force (ARF)-Based Methods. R Bouchard

#### **WE-G-19A-1 | 4:30-6:00PM Rm: 19A**

Radiologists and Medical Physicists: Working Together to Achieve Common Goals. A Jones, J Ma, J Steele, H Choi

#### **WE-G-19A-2 | 4:30-6:00PM Rm: 19A**

Radiologists and Medical Physicists: Working Together to Achieve Common Goals in Interventional Radiology. A Jones

#### **WE-G-19A-3 | 4:30-6:00PM Rm: 19A**

Radiologists and Medical Physicists: Working Together to Achieve Common Goals in MR Spectroscopy of Prostate Cancer. J Ma

### THURSDAY, JULY 24, 2014

#### **TH-A-18C-8 7:30-9:30AM Rm: 18C**

Design of a Small Animal Contrast Enhanced Dual Energy CT. R Martin, B Li, T Pan

#### **TH-A-17A-4 Thursday 7:30-9:30AM Rm: 17A**

Novel PET Imaging for Proton Therapy Applications. Y Shao

#### **TH-A-17A-1 | 7:30-9:30AM Rm: 17A**

Innovation in PET Instrumentation and Applications. M Casey, R Miyaoka, Y Shao

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