UTHealth The University of Texas Health Science Center at Houston | THE UNIVERSITY OF TEXAS MD Anderson Cancer Center

Graduate School of Biomedical Sciences

Alumni Newsletter
Volume 7 - 2013

Medical Physics Graduate Program

Annual MD Anderson Alumni Luncheon

25th Annual Alumni Luncheon at the upcoming AAPM Annual Meeting in Indianapolis!

- Tuesday, August 6, 2013
- 12:00 – 1:30 pm
- Indiana Convention Center (Rooms 231-232)

From the Program Director

This newsletter is filled with information on many important transitions in the Medical Physics Graduate Education Program. Therefore, my introductory comments, which will be my last in this newsletter as Program Director, are a bit longer than usual.

First, in case you have not heard, Georgeanne Moore has retired from MD Anderson after more than 16 years of service, first in the Department of Radiation Physics and then in the Department of Imaging Physics. Anyone associated with the Program during that tenure will surely attest to Georgeanne's incredible commitment to the Program, its students, and its faculty and staff. She provided support to our students that frequently extended well outside of MD Anderson and the expectations for her position. Time and sound advice for a student (or faculty member!) were always made available, no matter the day or time. Her contributions to the Program's success were numerous and she is very sorely missed. However, we all wish Georgeanne and Jim the best in a very well deserved retirement!

A new Program Manager for Education, Betsy Kindred, was recently hired as Georgeanne's replacement. Betsy formerly provided educational program support for the Immunology Program and we warmly welcome her to the Medical Physics Program and the Department of Imaging Physics.

Second, the Program will have a new Director effective August 2013. Richard "Bud" Wendt was recently elected as only the fourth Program Director in the long history of the Program. Without question, Bud has been a very strong supporter of, and contributor to, the Program for many years in the classroom and laboratory, in membership on numerous student committees, as a research mentor, as a longtime member of the Program Steering Committee and Admissions Subcommittee, and as the founder and tireless maintainer of our course material website. It is, therefore, very fitting that he was chosen to serve as Program Director and I wish him the very best. The Program will undoubtedly flourish under his leadership and that of the Deputy Director, Program Steering Committee, faculty, and staff.

Third, as I mentioned previously, my service as Program Director is near its end. For those who may not have heard, I will be leaving MD Anderson to become the chair of the Department of Medical Physics at the University of Wisconsin effective September 1, 2013. My migration north will come after 20 years on faculty at MD Anderson, 3 years on faculty at UTHealth Medical School, and 4 years as a student in the very graduate program for which I was fortunate enough to serve as Program Director. It was definitely not an easy decision to relocate, but I, and my family, look forward to the opportunities and challenges that this new position and location will provide.

My career at MD Anderson has provided me with many tremendous opportunities, for which I am incredibly thankful. It has allowed me to work with many faculty and staff members who are very strongly committed to each of the mission areas of this great institution. It has also allowed me the opportunity to work with the phenomenal staff at the Graduate School of Biomedical Sciences. It has been a tremendous honor to serve in the various roles I have served.

Without a doubt, one of the proudest affiliations I have had is with the Medical Physics Graduate Program and its students, faculty, and staff. I gratefully acknowledge everyone who has contributed to the success of this outstanding Program and humbly thank you for allowing me to serve as the Director. I especially want to thank the Deputy Directors, George Starkschall and Mohammad Salehpour, as well as the members of the Program Steering Committee and the Student-Faculty Liaisons who served during my tenure.

I must also acknowledge John Hazle, Geoff Ibbott, and Radhe Mohan as chairs of Imaging Physics and Radiation Physics during my tenure as Director. The Program could never have accomplished what it has without the support of the chairs of these two departments. I also want to thank Ken Hogstrom for encouraging me to take on the position of Program Director and for his advice and counsel in the transition between his tenure and mine. Finally, I want to thank Georgeanne Moore for her endless devotion to this Program during her dedicated service as Program Manager for Education.

As you will read later in the newsletter, our faculty and students have continued to be very active this year, resulting in important appointments, awards, and other recognitions. My congratulations to all those mentioned explicitly in this newsletter as well as to any others whose awards or appointments were unknown to us.

As always, if you have suggestions for the newsletter, please let the Program Director know or send your suggestions to the new Program Manager for Education, Betsy Kindred, at eckindre@mdanderson.org.

I hope to see many of you in Indianapolis!

Sincerely,
Ed Jackson

The Graduate Program in Medical Physics of The University of Texas at Houston Graduate School of Biomedical Sciences is hale and hearty. This newsletter describes the numerous accomplishments of our outstanding student body. They are a source of pride to our faculty and alumni. The good health of the program is due to the legacy of Drs. Robert Shalek and Ken Hogstrom, former program directors, and to the work of Dr. Ed Jackson, who is completing his service as program director in August and of Ms. Georgeanne Moore, who managed the program for the better part of two decades before her retirement this past March. Their insight, wisdom and stewardship has elicited a durable response from the program. They leave it well situated for the future.

Medical physics education is now a required stepping stone on the path to becoming a qualified medical physicist. The State of Texas recently eliminated the state examination for licensure, so that board certification is now required for full licensure in Texas. Thanks to the hard work of Drs. George Starkschall and Ed Jackson and others we have CAMPEP approval and are working on institutional approval of a certificate course that would enable PhD scientists to take the didactic portion of our graduate medical physics curriculum in one year and then qualify to enter a CAMPEP residency in preparation for the American Board of Radiology certification process.

Our Specialized Master of Science program has many illustrious alumni, yet SMS graduates face growing challenges competing with PhD medical physics graduates for the residency positions that are a prerequisite of ABR certification. We are developing a professional doctorate program, the details of which are still being refined, to enable students whose primary focus is to practice clinical medical physics to obtain a doctoral-level degree and residency-level clinical experience.

While there are changes on the horizon for our profession and our program, the constant, bedrock foundation of our program is our alumni. It is you who have earned the program its sterling reputation. It is your support, both moral and financial, that makes the program as strong as it is and its future so promising. I would ask for your continued advice and support as we work to secure that promise for our present and future alumni.

Bud Wendt

New Program Faculty and Associates 2012-13

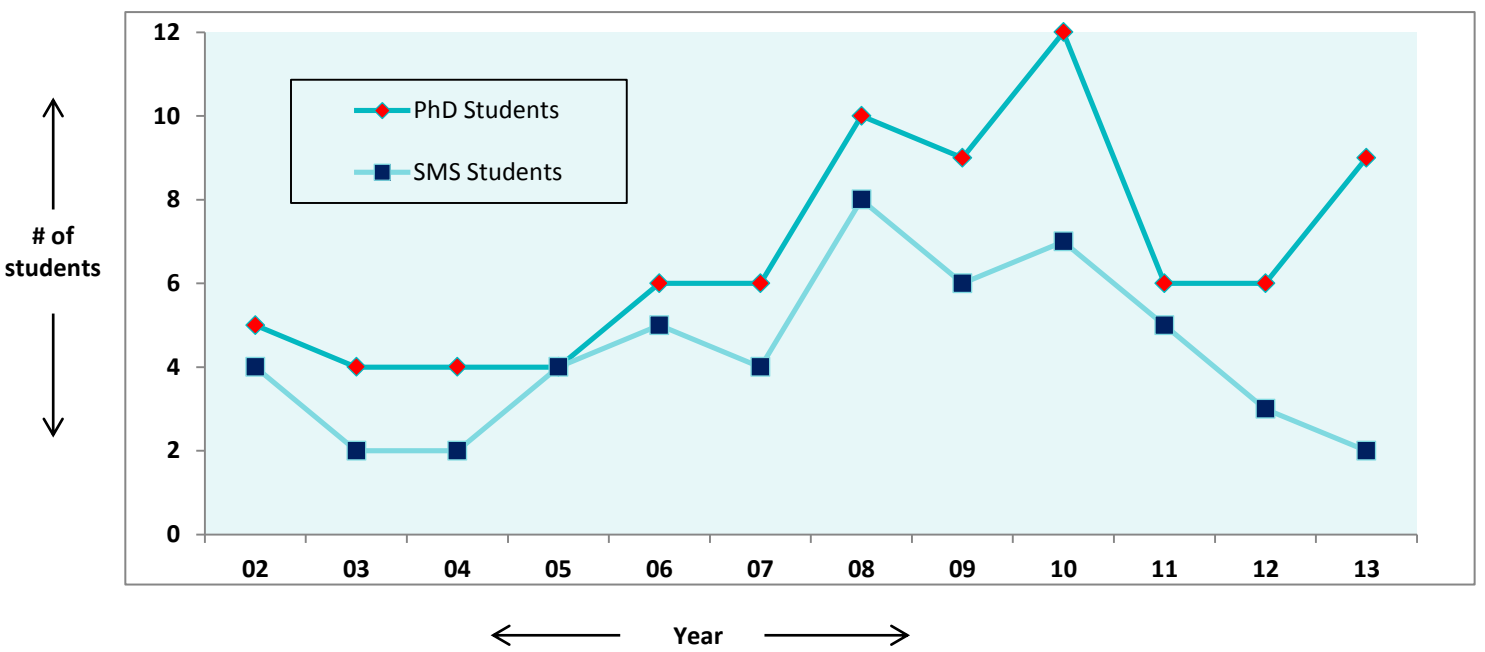
Clearly, the program cannot succeed without the commitment of its faculty and associates.
We are happy to report that the following faculty and program associate members have recently joined our program.

New Program Faculty (Joined Program or Changed Classification from Associate to Full Member)		
Xinming Liu, PhD	Assistant Professor	Imaging Physics
Adam Melancon, PhD	Assistant Professor	Radiation Physics
Yiping Shao, PhD	Associate Professor	Imaging Physics
New Program Associates		
Richard Amos, MS	Sr. Medical Physicist	Radiation Physics
Richard Castillo, PhD	Instructor	Radiation Physics
Melinda Chi, PhD	Assistant Professor	Radiation Physics
Wiliang Du, PhD	Assistant Professor	Radiation Physics
Dershan Luo, PhD	Assistant Professor	Radiation Physics
Marites Melancon, PhD	Assistant Professor	Diagnostic Radiology
Julianne Pollard, PhD	Assistant Professor	Radiation Physics
Eva Sevick, PhD	Professor	UTHealth
James Yang, PhD	Associate Professor	Radiation Physics

Applicant Data	PhD	SMS
Total Number of Applications	62	22
Number of Offers	12	3
Number of Acceptances	9	2
Average Scores Admitted Students	**PhD**	**SMS**
Undergraduate GPA	3.64	3.32
Graduate GPA	3.70	N/A
Verbal GRE	161.4	154.5
Quantitative GRE	163.4	160.5
Analytical GRE	4.3	4.0
Verbal + Quantitative GRE	324.9	315.0

SMS Incoming Class	Undergraduate Institution	
Mattie McInnis	TAMU	
Olivia Popnoe	Angelo State	
PhD Incoming Class	**Undergraduate Institution**	**Graduate Institution**
Diane Choi	Rice University	
Daniel Craft	BYU	
Katie Dextraze	Georgia Tech	GSBS
Joshua Gray	Boston University	
Sara Loupot	TAMU	
Rachel McCarroll	Truman State	
Drew Mitchell	TAMU	
Angela Steinmann	Stetson University	U Michigan

Number of Matriculated Students by Year



Recent Graduates

Eight students completed their degree requirements since the publication of the last newsletter:

MS or SMS in Program in Medical Physics

Janelle Bergene, Medical Physicist at Leighhigh Valley Hospital
Yi Pei Chen, Undecided
Luke Hunter, Returned to Medical School
Michael Silosky, Medical Physicist at University of Colorado
Kevin Vredevoogd, Medical Physicist at St Luke's Hospital

PhD Program in Medical Physics

Moiz Ahmad, Postdoctoral Fellowship at Stanford University
Chad Bircher, Detector Scientist, GE Global Research
Peter Park, Postdoctoral Fellowship at MD Anderson
Henry Yu, Medical Physicist I at Christiana Care Health System

Robert J. Shalek 12th Biennial Fundraiser

Eighty-six students have been supported by fellowships to date. The first round of letters for solicitation of donations for the 12th Biennial Fundraiser went out in October 2011. In the current fundraising cycle, we have received a total of $40,750. Contact Betsy Kindred at (713) 563-2548 or eckindre@mdanderson.org with donation questions.

Shalek Fellowship Recipients By Year

2013
- Mattie McInnis
- Olivia Popnoe

2012
- Ming Jung Hsieh
- Jennifer Sierra Irwin
- Dana Lewis
- Justin Mikell

2011
- Shuaiping Ge
- Annelise Giebeler
- 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
- Yevgeney 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 Qazq
- 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

Honors & Awards During the 2012-2013 Academic Year

Kevin Casey (mentor: David Followill)
- Aaron M. Blanchard Medical Physics Research Award

Joey Cheung (mentor: Laurence Court)
- UT Health Student InterCouncil Toshi Nikaidoh Service Award Scholarship

Jongmin Cho (mentor: Geoffrey Ibbott)
- 1st place, Research Abstract, AAPM Korean Association of Medical Physicists in North America
- 4th place, Society of Nuclear Medicine and Molecular Imaging Computer and Instrumentation Young Investigator Symposium
- AAPM "Best in Physics" oral and poster presentation
- GSBS Student Travel Award

Katie Dextraze (mentor: Jason Stafford)
- Howard Hughes Medical Institute Med-Into-Grad Summer Program Fellowship
- President-Elect, Graduate Student Association at GSBS
- Member, Student InterCouncil at UTHSC-Houston

John Eley (mentor: Rebecca Howell)
- Rosalie B. Hite Fellowship

Sam Fahrenholtz (mentor: Jason Stafford)
- 3rd place, 2012 AAPM John R. Cameron Young Investigator Symposium

Xenia Fave (mentor: Laurence Court)
- AAPM/RSNA Graduate Fellowship

David Fried (mentor: Laurence Court)
- Recipient of an AAPM Predoctoral Fellowship

James Kernes (Edward Jackson)
- 1st place, 2013 SWAAPM Young Investigator

Shane Krafft (mentor: Mary Martel)
- 2nd place, 2012 AAPM John R. Cameron Young Investigator Symposium
- Jess Hay Chancellor's Graduate Student Research Fellowship Nominee, 2013
- GSBS Student Travel Award
- Cancer Prevention Research Institute of Texas (CPRIT) Graduate Scholar Award
- 2nd place, AAPPM John Cunningham Young Investigator Award

Olivia Huang (mentor: Geoffrey Ibbott)
- CIRMS Student Award
- GSBS Student Travel Award

Hannah Lee (mentor: Geoffrey Ibbott)
- GSBS Faculty & Alumni Merit Fellowship
- GSBS Student Travel Award
- NSF GRFP Fellowship

Chris MacLellan (mentor: Jason Stafford)
- 3rd place (tied), SWAAPM Young Investigator Symposium
- T32 Fellowship UT Health's Center for Clinical & Translational Sciences

Jessica Nute (mentor: Dianna Cody)
- MD Anderson Trainee Research Poster Finalist
- RSNA Trainee Research Prize
- 1st place, MD Anderson Medical Physics Research Retreat
- 1st place, SWAAPM Young Investigator Symposium

Daniel Robertson (mentor: Sam Beddar)
- Andrew Sowell-Wade Huggins Scholarship in Cancer Research

Ashley Rubinstein (mentor: Laurence Court)
- 2013 Young Investigators Award at Precision Small Animal Irradiation Workshop

Adam Yock (mentor: Laurence Court)
- 2nd Place, Medical Physics Program Summer Research Retreat
- American Legion Auxiliary Fellowship
- 2nd place, SWAAPM Young Investigator Symposium

GSBS Medical Physics Program Trainee Presentation Information for the Upcoming AAPM Meeting in Indianapolis

Sunday, August 4, 2013
CT Topics **1:00 - 1:55 pm, Room 134**
SU-C-134-2 **Kelsey Mathieu**, Radiation Dose Reduction for CT Lung Cancer Screening Using Advanced Image Reconstruction Techniques
SU-C-134-7 **Henry Yu**, Development and Validation of a Fast Volumetric Determination Method of Visceral Adipose Using CT Images
Image Registration and Segmentation **1:00 – 1:55 pm, Wabash Ballroom**
SU-C-WAB-2 **Henry Yu**, Voxel-By-Voxel Validation of Deformable Image Registration Between External Beam and Intracavitary Brachytherapy Images Using Artificial CT Images Created From Patient Populations
Small Animal Studies **2:05 - 3:00 pm, Room 144**
SU-D-144-2 **Rachael Martin**, Four-Dimensional Cone Beam CT for a Small Animal Image Guided Radiation Therapy System Without Use of An External Respiratory Monitoring System
SU-D-144-3 **Ashley Rubinstein**, Respiratory Motion Management for High-Precision Small Animal Irradiation
Imaging Campus Poster: Quantitative Imaging & Metrology **3:00 – 6:00 pm, Exhibit Hall**
SU-E-CAMPUS-I-6 **David Fried,** Imaging Biomarkers of CT Textural Analysis Correlate to Genomic Expression in Oral Cavity Squamous Cell Carcinoma
Imaging General Poster Discussion **3:00 – 6:00 pm, Exhibit Hall**
SU-E-I-86 **Hua Ai**, Evaluation of Segmentation Based Attenuation Correction Methods for PET/MR in the Thorax
SU-E-I-95 **J Chung**, Verification of AAPM TG 116 X-Ray Beam Quality by CdTe Spectroscopy
Joint Imaging –Therapy General Poster Discussion **3:00 – 6:00 pm, Exhibit Hall**
SU-E-J-59 **Katherine Dextraze**, Visualizing Target Coverage by Iceball During MRI-Guided Cryoablation
SU-E-J-168 **Xenia Fave**, Investigating the Feasibility of Vertical CBCT Imaging Using the Varian TrueBeam LINAC
SU-E-J-211 **Adam Yock,** Hierarchical Clustering and Classification Improve the Prediction of GTV Response Throughout the Course of Head and Neck IMRT

Sunday, August 4, 2013, Continued
Therapy General Poster Discussion **3:00 – 6:00 pm, Exhibit Hall**
SU-E-T-73 **Mitchell Carroll,** Investigation of 3D Dosimetry for Proton Therapy Using PRESAGE
SU-E-T-101 **Ashley Rubinstein,** Is EBT3 Energy Independent for Radiation-Therapy Photon & Electron Beams?
SU-E-T-105 **Scott Ingram**, An Evaluation of Two Organic Liquid Scintillators for Use in Real-Time 3D Proton Dosimetry
SU-E-T-159 **Austin Faught,** Development of An Independent, Monte Carlo, Dose Calculation, Quality Assurance Tool for Clinical Trials
SU-E-T-163 **Elizabeth McKenzie**, Reproducibility in the Field of Patient-Specific IMRT QA
SU-E-T-275 **Kenneth Homann**, Voxelized Second Cancer Risk Calculation - Comparison of Proton and Photon Radiotherapies for Hodgkin Lymphoma
SU-E-T-278 **John Eley**, Risk of Developing a Second Cancer in the Breast for Hodgkin Lymphoma Patients Receiving Carbon Ion Therapy Versus Proton Therapy
SU-E-T-378 **Jackie Tonigan**, IMRT Severity Scoring for TG-100: Do You Really Know?
SU-E-T-666 **Joey Cheung**, Evaluation of Various Spot MU Correction Methods for Range Adaptive Scanning-Beam Proton Planning
SU-E-T-683 **Joey Cheung**, Prediction of Sensitivity of IMPT Plans to Anatomical Change Due to Plan Complexity
SU-E-T-701 **Shuaiping Ge**, Equivalence and Differences Between Robust Optimization Methods and PTV Based Optimization Method for IMRT and IMPT
Monday, August 5, 2013
Motion Management **4:30 – 6:00 pm, Wabash Ballroom**
MO-F-WAB-4 **Jason Matney**, Does a Threshold of Tumor Motion Exist to Indicate Respiratory Gating for Proton Therapy?
MO-F-WAB-10 **Rachael Martin**, Evaluation of Scan Time Required for Motion Tracking in Four-Dimensional Cone Beam CT Using Patient Data Sets

Tuesday, August 6, 2013
Therapy Assessment - Multi-Modality Imaging **8:00 – 9:55 am, Wabash Ballroom**
TU-A-WAB-11 **Luke Hunter**, Tumor Shrinkage Prediction Using CT Image Features
Treatment Planning, Delivery, Verification: Particle Therapy **8:00 – 9:55 am, Room 108**
TU-A-108-7 **James Neihart**, Design and Verification of a Heterogeneous Proton Equivalent Thorax Phantom for Use in End-To-End Assessment of Pencil Beam Proton Therapy
Treatment Delivery and Verification: Photons and Electrons **2:00 - 3:50 pm. Room 108**
TU-E-108-7 **James Kerns**, A Multi-Institutional Evaluation of Multileaf Collimator Performance
Outcomes Analysis **4:30 – 6:00 pm, Room 108**
TU-G-108-4 **Shane Krafft**, Lack of Differentiation in Performance of Predictive Radiation Pneumonitis Models
TU-G-108-7 **Joshua Niedzielski**, Development and QA of a Novel Framework to Quantify Normal Tissue Toxicity Using the Jacobian Map
MRI 1 **4:30 - 6:00 pm, Room 134**
TU-G-134-5 **Tze Yee Lim**, MRI Characteristics of Cobalt Dichloride N-Acetyl Cysteine (C4) as a Contrast Agent Marker for Prostate Brachytherapy

Wednesday, August 7, 2013
MRI 2 **10:30 am – 12:30 pm, Room 116**
WE-C-116-3 **Christopher MacLellan**, Spectral Parameter Estimation in the Presence of Macroscopic B0 Variations Using Fast Chemical Shift Imaging
WE-C-116-10 **Samuel Fahrenholtz**, Univariate, Multivariate, and Nonlinear Uncertainty Quantification for Magnetic Resonance-Guided Laser Induced Thermal Therapy
Novel Imaging Techniques and Applications **4:30 PM - 6:00 pm, Room 500 Ballroom**
WE-G-500-1 **Luke Hunter**, Identification of High Quality Machine-Robust CT Image Features
WE-G-500-2 **Jongmin Cho**, BEST IN PHYSICS (JOINT IMAGING-THERAPY) - Proton Beam Range Verification Using Proton Activated Fiducials and Off-Site PET
Thursday, August 8
IMRT Optimization, Plan Evaluation & Robustness Analysis **8:00 – 9:55 am, room 116**
TH-A-116-1 @ 8:00 am **Peter Park,** A Statistical Approach to Quantification and Visualization of Setup and Range Uncertainties for Proton Plan Verification
H-A-116-3 @ 8:20 am, **Jason Matney**, Photon and Proton Radiotherapy of the Lung Would Benefit From 4D Dose Calculation Techniques
Radiobiology and Biological Modeling **2:00 – 2:50 pm, Room 105**
TH-F-105-5 @ 2:40 pm **Christopher Peeler,** Comparison of Results for RBE-Weighted Dose from Two RBE Models for Proton Therapy Treatment Plans

Georgeanne

Farewell, Georgeanne!

The Medical Physics Graduate Program extends a big "thank you" to Georgeanne and wishes her and her family all the best in the years to come.

Betsy

Welcome, Betsy!

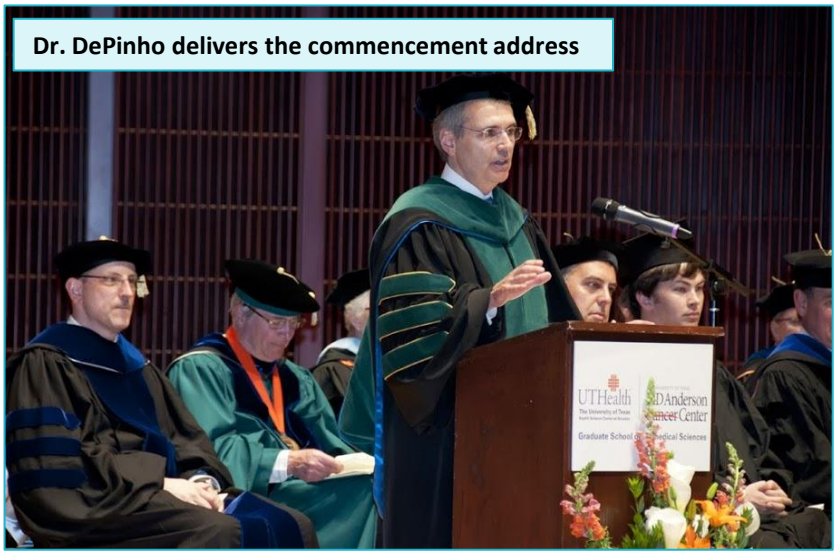
If you will be attending the upcoming AAPM Annual Meeting & Exhibition, please make a point to stop and introduce yourself to Betsy.

Betsy Kindred
Program Manager, Education
Department of Imaging Physics
713.563.2548
eckindre@mdanderson.org

The 2013 GSBS Commencement Ceremony was Held on Saturday May, 18, 2013 on the Rice University Campus.

Photos by Dwight Andrews

Dr. Victoria Knutson gives instructions to soon-to-be-graduates



Dr. DePinho delivers the commencement address

Henry Yu and Rajat Kudchadker

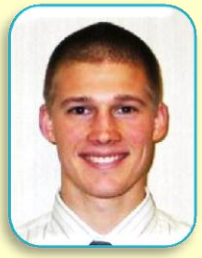
Deans Barton and Blackburn prepare to confer degrees

Deans Barton and Blackburn

Presidents DePinho and Colasurdo

2012-2013 Student Update

By Austin Faught



I am excited to say that the first year of our newly formed Student Council was a great success. In addition to the already existing position of Student-Faculty Liaison (Austin Faught), we recently added positions of Assistant Student-Faculty Liaison (Jackie Tonigan), Education Representative (John Eley), First-Year Representative (Katie Dextraze), and Social Representative (Scott Ingram). This expansion not only allowed more students to get involved, but has also allowed student representatives to take on more projects that directly benefit the entire student body.

Among this year's highlights was our annual research retreat. Our guest facilitator, Dr. Charles Coffeey of Vanderbilt University, spoke on his time as a medical physicist over the past thirty plus years while also moderating the student research presentations. Winners, as voted upon by the student body, were:
1st place - Jessica Nute
2nd place - Adam Yock,
3rd place - Landon Wootton
The research retreat concluded with our third edition of Medical Physics Jeopardy.

Students have also been active in organizing and participating in a few mini-courses. These included a two week long, student-led MATLAB course, a week long, student-led MATLAB primer for new students, and an ABR Part 1 prep course designed to explain the format of the exam and guide the studying of students sitting for the Fall 2012 exam.

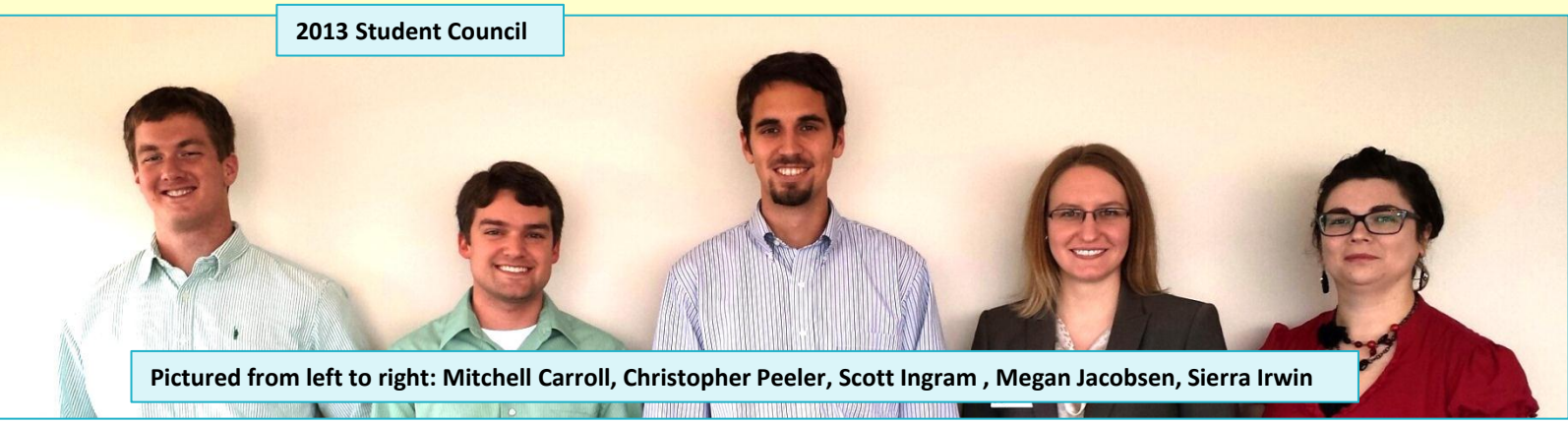
Outside of the classroom, our students continue to show an enthusiasm for intra-mural sports as the Medical Physics Program fielded teams in flag football, soccer, and volleyball. This enthusiasm has translated well to our enjoyment, but not so well towards the win column.

This past Spring marked the end of the term for our first Student Council, and the student body elected a new group consisting of Chris Peeler (Student-Faculty Liaison), Scott Ingram (Assistant Student-Faculty Liaison), Mitchell Carroll (Education Representative), Megan Jacobsen (First-Year Representative), and Sierra Irwin (Social Representative).

In addition to voting on a new Student Council, this also was the first year the students voted upon a recipient of the Medical Physics Program Outstanding Teaching Award. As a way to recognize a faculty member for truly exceptional work in the classroom or lab this award will be voted upon yearly, and a plaque acknowledging each year's winner will be displayed in the Imaging Physics Department in Pickens Tower. This year's winner, Dr. George Starkschall, has shown a truly extraordinary commitment to graduate education in Medical Physics, and I am very happy with his selection as the first recipient of the award.

As a final parting note, I would like to thank the Student Council for their work and service in making this a great year, and I would also like to recognize Georgeanne Moore and Gloria Mendoza for their outstanding job in helping to organize the logistics of the student events and meetings.

2013 Student Council



Pictured from left to right: Mitchell Carroll, Christopher Peeler, Scott Ingram , Megan Jacobsen, Sierra Irwin

Student Research Retreat 2013

The annual, day-long Student Research Retreat is a student-organized event which provides students with an opportunity to receive feedback on their research and presentation skills from their peers. The 2013 retreat was guest facilitated by Dr. Robert Jeraj from the University of Wisconsin.

At the request of the students, Dr. Jeraj took time to discuss "the future of academic medical physics and medical physics research." Given the recent changes to the board certification process, this topic was deemed particularly important by the student council and student body as a whole. The retreat was held on Wednesday, July 24, 2013.

Contact Christopher Peeler (crpeeler@mdanderson.org) for additional information.

Personnel

Faculty – Newly Appointed & Promotions

- Dianna Cody, PhD, appointed as Deputy Department Chair of Imaging Physics
- Richard Bouchard, PhD , appointed Assistant Professor
- David Fuentes, PhD, appointed Assistant Professor
- Osama Mawlawi, PhD, appointed as Section Chief of Nuclear Medicine Physics
- Jason Stafford, PhD, appointed as Section Chief *ad interim* of MR & Ultrasound Physics
- Richard Wendt III, PhD, elected Director of the Medical Physics Graduate Program and appointed Deputy Chair for Education

Staff – Newly Hired & Promotions

- Vanessa Floyd, Grant Program Manager
- Jim Jacob, Administrative Assistant
- Antonia (Toni) V. Jordan, Office Manager
- Elizabeth (Betsy) Kindred, Program Manager, Education
- Kiersten Maldonado, Imaging Research Technologist
- Frances Quintana, Administrative Assistant
- Jong Bum Son, Sr. Research Scientist

Faculty Honors, Awards & Recognition

Dianna D. Cody, PhD

- Received the FDA's CDRH Director's Special Citation Award (AAPM WGCTNP)
- Appointed member of the NASA FE Task Force ((Astronaut Bone Medical Standards))

William R. Geiser, PhD

- Appointed member of the FDA National Mammography QA Advisory Committee

John D. Hazle, PhD

- Elected AAPM President

Edward F. Jackson, PhD

- Received the MD Anderson Cancer Center Faculty Educator of the Month Award

Imaging Physics Residency Program

Charles E. Willis, M.S., PhD, FAAPM
Associate Professor and Program Director
Imaging Physics Residency Program
Department of Imaging Physics
Division of Diagnostic Imaging

The Imaging Physics Residency Program is undergoing reaccreditation by CAMPEP. We are in the process of recruiting two more residents to start in 2014, with one of these to be a Medical Physics Fellow in the hybrid research and clinical training program.

The program now has a total of four residents:

- **Nathan Busse, PhD** – Joined the program in August 2011 (from Vanderbilt University) and is nearing completion of his 2nd year.
- **Cristina Dodge, MS** – Joined the program in May 2012 (from Wayne State University) and has completed her 1st year.
- **Leland Page, PhD** – Joined the program in May 2012 (from The University of Texas Health Science Center at San Antonio - GSBS) and has completed his 1st year.
- **Vaibhav Juneja, PhD** – Joined the program in September 2012 (from The University of Texas Health Science Center at Houston – GSBS.)
- **Guang Li, PhD** – Will join the program on July 29, 2013 (from The University of Texas Health Science Center at San Antonio – GSBS.)
- **Ching-Yi Hsieh, MS** – Completed the program in November 2012 and is currently working as a Research Associate at Wayne State University.
- **Shannon Fritz, PhD** – Completed the program in May 2013 and is currently working with Sutter Health in California.

Congratulations to our resident alumni who passed their boards this year: Andreea Dohatcu, Travis Greene, Wendy Siman and James Winslow!

Imaging Physics Resident Presentation Information for the Upcoming AAPM Meeting in Indianapolis

Sunday, August 4, 2013
Imaging General Poster Discussion **3:00 – 6:00 pm, Exhibit Hall J**
SU-E-I-36 **Leland Page, PhD,** Co-authors: Vikas Kundra, MD & John Rong, PhD, Investigation of Renal CT Dose Reduction Using Model Based Iterative Reconstruction
SU-E-I-67 **Nathan Busse,** MS, Co-author: Leland Page, PhD, Effects of Normalization, Filtration, and Distortion Correction Options on MRI ACR Phantom Images

Tuesday, August 6, 2013
Radiography/Fluoroscopy **8:00 - 9:55 am, Room 116**
TU-A-116-8 @ 9:10 am, **Vaibhav Juneja, PhD,** Co-author: Nathan Busse, MS, A Methodology to Estimate Radiation Dose Reported on a Personal Radiation
CT Image Quality **10:30 am – 12:30 pm, Room 103**
TU-C-103-9 @ 11:50 am, **Cristina Dodge, MS**, Co-author: John Rong, PhD, CT Model-Based Iterative Reconstruction: How Much Dose Can We Save?

www.mdanderson.org/imaging-physics-residency-program

Funded Grants

CPRIT-RP101243-P05 (**Project PI: Bankson**): Project 5: Fast Imaging Methods for Hyperpolarized Nuclei, 08/01/2010 - 07/31/2013, $154,058 direct costs (annual)

NIH/Internal Prostate SPORE (**Project PI: Bouchard**): Development and Optimization of a Photoacoustic-Ultrasonic Transrectal Imaging System for the Improved Visualization of Prostate Brachytherapy Seeds, 07/01/2011-08/31/2013, $50,000 direct costs (annual)

NIH/NCI–S10OD010403 (**PI: Hazle**): VisualSonics Vevo LAZR High-Resolution in Vivo Micro-Imaging System, 05/18/2012 – 05/17/2013, $596,100 direct costs (annual)

NIH/NCI- P30CA016672 (**Cancer Center Support Project PI: Hazle**): Small Animal Imaging Facility, 07/01/78-06/30/2014, $380,429 direct costs (annual)

NIH-T32CA119930 (**PI: Jackson**): Medical Physics Training Grant for Image-Guided Therapy Research, 08/04/06-07/31/2013, $30,032 direct costs (annual)

NCI – R01 CA138986, (**Subcontract PI: Kappadath**): A Novel Dose Calculation Method for Targeted Radionuclide Therapy, 03/01/2012-07/31/2013, $160,627 direct costs (annual)

MDACC IRG, (**PI: Lai/Shaw**): Three-Dimensional Simulation of Tumor Masses for Cone Beam Breast Computed Tomography, 01/01/2013-12/31/2013, $50,000 direct costs

MDACC – TRC, **(PI: Ma**): Plug & Play on GE MRI Scan, project period N/A, $30,000

MDACC – TRC, (**PI: Ma**): Phase Sensitive T-2 Weight MRI, project period N/A, $50,000

CPRIT- RP110562-P2 (**Project PI: Pan**): Advanced Volumetric Imaging and Adaptive Radiotherapy for Detecting and Correcting for Inter-fractional Changes, 06/01/2011-05/31/2016, $295,004 direct costs

CPRIT-RP120326 (**PI: Shao**): In-Situ PET Imaging for Adaptive Proton Therapy, 12/01/2011-11/30/2014, $435,924 direct costs

MDACC IRG (**PI: Shao**): Novel PET Imaging for Translational Radiation Therapy Research, 06/01/2012-05/31/2014, $50,000 direct costs

NIH/NCI–R01CA138502 (**PI: Shaw**): DTS Imaging with a Digitally Addressable X-Ray Source (DAXS), 05/01/2010 – 02/28/2015, $2,378,957 direct costs

NCI-R33 CA124585 (**PI: Shaw**): A Dual Resolution Cone Beam CT System for 3-D Breast Imaging, 09/01/2007-08/31/2013, $304,751 direct costs (annual)

NCI-2R44 CA139830 (**Subcontract PI: Stafford**): Flat Panel X-Ray Sources for Digital Breast Tomosynthesis System, 04/01/2009-08/31/2014, $161,835 direct costs (annual)

NIH/NCI-R01CA103830 (**Subcontract PI: Sokolov**): Optical Systems for in Vivo Molecular Imaging of Cancer, 09/23/2011-07/31/2016 $281,010 direct costs (annual)

NIH/NCI-R01EB008101 (**Subcontract PI: Sokolov**): Acoustic Imaging of Sentinel Mode Metastasis Using Plasmonic Nanosensors, 04/01/2012-02/28/2016, $178,045 direct cost (annual)

NIH/NCI– R01CA143663 (**PI: Sokolov**): Biodegradable Plasmonic Nanoparticles for Cancer Imaging and Therapy, 01/01/2010 – 12/31/2014, $1,367,061 direct costs

NIH/NCI– R01CA149740 (**Subcontract PI: Sokolov**): Molecular Photothermal Therapy of Cancer Using Targeted Metal Nanoparticles, 07/01/2010 – 05/31/2015, $125,000 direct costs

NCI-R01 CA158598 (**PI: Sokolov**): Functional Cellular and Molecular Imaging Using Ultrasound-Guided Photoacoustics, 10/01/2012-08/31/2017, $82,178 direct costs (annual)

NIH/NCI–R21EB010196 (**PI: Stafford**): Prospective 3D Treatment Planning for MR-Guided Laser Induced Thermal Therapy Procedures, 09/01/2010 – 08/31/2013, $250,000 direct costs

Prostate Cancer Research Fund (**PI: Stafford**): Prostate Cancer Research, project period N/A, $50,000

MDACC-TRC (**PI: Wang**): Method and Apparatus for Displaying and Visualizing Three-Dimensional Diffusion Tensor Imaging Data in Magnetic Resonance Imaging , project period N/A, $30,000

R43 CA150601 (**PI: Wendt**): A New Radiopharmaceutical for the Treatment of Metastatic Bone Cancer, 09/27/2010-09/26/2013, $28,018 direct costs (annual)

Trainee Updates

Radiation Physics Residency Program
Abbie Wood, PhD completed the program on June 20, 2013
Ming Yang, PhD will be completing the program on July 31, 2013

Three new residents will be joining the program this summer:
Sandeep Dhanesar, PhD (Radiation Physics Proton Therapy Fellow)
Athena Heredia, PhD (University of Wisconsin)
James Neihart (GSBS Medical Physics Program – completing MS degree August 2013)

Postdoctoral Fellows
Since the last report, two postdoctoral fellows have joined the program (Fada Guan and Cheuk Hui) joining the other three: Tao Han, Slade Klawikowski, Francois Therriault (Odyssey Fellow)

Mohammad R. Salehpour, PhD, DABR
Professor and Director of Education
Department of Radiation Physics
Division of Radiation Oncology

Personnel

Faculty – Newly Appointed
- Manickam Muruganandham, PhD, Assistant Professor
- Gabriel Sawakuchi, PhD, Assistant Professor
- Melinda Chi, PhD, Assistant Professor
- Sang Hyun Cho, PhD, Professor
- Edward Castillo Jr., PhD, Assistant Professor
- Ramiro Pino, PhD, Assistant Professor

Staff – Newly Hired
Jared Ohrt, Jr., Medical Physicist
Ryann Hurtt, Physics Assistant

Major Achievements in Radiation Physics

Sang H. Cho, PhD
Recruitment Start-Up Award - $300,000

Gabriel Sawakuchi, PhD
Recruitment Start-Up Award - $450,000

Gabriel Sawakuchi, PhD
Elekta MR-Linac Master Research Agreement - $29,148
"Determination of Correction Factors for the Use of Commercially Available Ionization Chambers in the Presence of Magnetic Fields"

Heng Li, PhD
Varian Medical Systems - $81,240
"Predict and Adapt for Dose Variation in Spot Scanning Proton Therapy from Setup and Anatomical Change"

David Followill, PhD
ACR NIH/NCI Transition Supplement - $52,890
"Radiation Therapy Oncology Group - IROC"

Michalis Aristophanous, PhD
Varian Medical Systems - $71,580
"Multidosimetry Dose Optimization of Target Definition in Radiation Therapy"

Laurence Court, PhD & Peter Balter, PhD
Varian Medical System - $109,755
"Comparison of Varian 2D-3D mMtch vs RTT Determined Patient Shift"

Laurence Court, PhD
Elekta MR-Linac Master Research Agreement - $20,020
"Use of the MDACC Precision Small Animal Irradiator for in vivo Evaluation of the Radiobiological Effect of Treating in a Magnetic Field Feasibility Study"

Gabriel Sawakuchi, PhD
University of Texas MD Anderson Internal Research Grant - $50,000
"Towards Temporal and Spatial Measurements of Radiation Injury in Live Cells"

Major Achievements in Radiation Physics, Continued

Jinzhong Yang, PhD
Varian Medical System - $61,250
"Online Selection of Optimal Atlas Candidates for Atlas-Based Auto-Segmentation"

Xiaodong Zhang, PhD
Varian Medical System - $181,250
"Knowledge-Based Intensity Modulated Proton Therapy Treatment Planning"

Zhifei Wen, PhD
Elekta MR-Linac Master Research Agreement - $50,304
"Evaluation of Dose Responses of Radiation Dosimeters in the Presence of a Strong Magnetic Field"

Honors & Awards

- **Marilyn Stovall, PhD** – Selected as the Radiation Research Society Failla Award. Highest award given out by the society goes this year to for her lifetime achievements in science. She will get her award in New Orleans this September.
- **Radhe Mohan, PhD** - Selected to receive the 2013 Gold Medal. The Gold Medal, ASTRO's highest honor, recognizes distinguished members who have made outstanding contributions to the field of radiation oncology, including research, clinical care, teaching and service.
- **Paige Summers, MS** - Selected for the ABS/Nucletron jointly sponsored HDR Brachytherapy Scholarship program for 2013. Her training will be at Arizona Breast Care.
- **Rajesh Pidikiti, Medical Physics Resident** - A. Lavoy Moore Endowment Fund Award - $2,000, 2012-2013 Trainee Endowed Fellowship Awards given to clinical trainees, in recognition of his work in lung cancer research.

Funding Sources

The RPC grant was funded for the third year of its current three year grant period. Even though the initial funding level was at 68% of last year's amount, we have subsequently been advised that our missing funds will be reinstated to the FY2012 level. Radiological Physics Center, CA 10953, 2011-2013, $10,365,915 ($3,455,305/year includes program income generated under the Additional Cost Alternative)

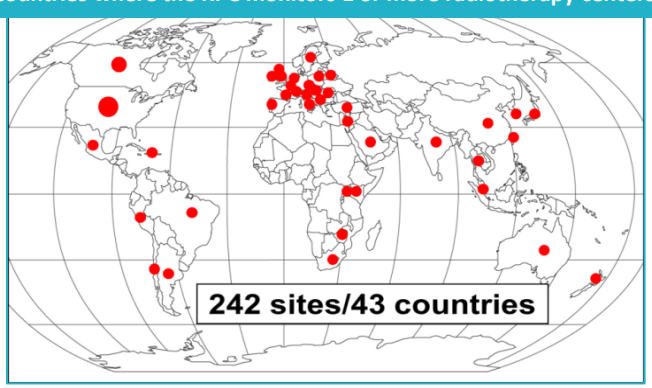
Advanced Technology Radiation Therapy Quality Assurance Review Consortium, 2 U24 CA081647, Washington University, 7/1/2007–6/30/2013, $409,901 ($81,980/year). We are waiting to see if this grant will be extended to March 2014 when the new clinical trial network begins.

Veterans Administration, National Medical Physics Peer-Review of Radiation Therapy Quality Assurance Operations, 9/27/2010-12/31/2013, $740,718 ($246,906/year). This contract is anticipated to be renewed for another 3 year period.

The funding from Massachusetts General Hospital was granted a no cost extension to the end of 2012. These funds from MGH/NCI are for the Development of Standard Operating Procedures for Dosimetry Validation and Accreditation of Proton Therapy Centers, 4/1/2011-12/31/2011, $122,000 ($122,000/year). This contract has been renewed for 2013.

A total of 1,926 active institutions are now being monitored, including 35 in Canada, 242 elsewhere in 43 other countries throughout the world. Nearly 3300 RPC phantoms have been shipped and irradiated since we began this program in 2001. Our experience shows that about 10-15% of institutions fail to irradiate the phantoms according to their treatment plans.

Countries where the RPC monitors 1 or more radiotherapy centers



The RPC has audited 12 proton facilities. Twelve proton centers have irradiated TLD (including one in Japan) and site visits have been conducted to ten sites and clinical trial credentials have been given to ten sites. Four or five more site visits are scheduled for the remainder of this year.

RPC Presentations at AAPM

These projects are collaborations with faculty and staff from Radiation Physics and Imaging Physics.

1. Accuracy Requirements and Uncertainties Considerations in Radiation Therapy
2. Design and Verification of a Heterogeneous Proton Equivalent Thorax Phantom for Use in End-To-End Assessment of Pencil Beam Proton Therapy
3. Results of Irradiations Performed On Radiological Physics Center's Anthropomorphic Lung Phantom and Respiratory Simulating Motion Table
4. Radiological Physics Center (RPC) Approval of Proton Centers for NCI-Sponsored Clinical Trials
5. Initial Results From Multiple Irradiations of An Anthropomorphic Liver Phantom
6. The Value of Rapid Reviews
7. A report on flattening filter free c-arm linear accelerators from the Therapy Emerging Technology Assessment Work Group
8. Reproducibility in the Field of Patient-Specific IMRT QA
9. Evaluation of the Sensitivities of Patient Specific IMRT QA Dosimeters
10. IMRT Severity Scoring for TG-100: Do You Really Know?
11. Characterization of OSLDs for Use in Small Field Photon Beam Dosimetry
12. In-House IMRT QA Versus External Phantom Audit Results
13. Development of An Independent, Monte Carlo, Dose Calculation, Quality Assurance Tool for Clinical Trials
14. Identification of High Quality Machine-Robust CT Image Features
15. Tumor Shrinkage Prediction Using CT Image Features
16. Project-Based Learning - Expanding Course Content with a Broad-Scope Project
17. A Multi-Institutional Evaluation of Multileaf Collimator Performance
18. Dosimetric Impact of Implementing Kernel Hardening and Material-Specific Kernels in the Convolution/Superposition Method
19. Managing and Leading Others: Practical Advice for Medical Physicists
20. The Imaging and Radiation Oncology Core (IROC) Group: a Proposed New Clinical Trial Quality Assurance Organization
21. National Dose Audit of the Quality of Head and Neck IMRT in the Danish Head and Neck Cancer Group (DAHANCA)
22. Intensity Modulated Proton Therapy Plans with Multiple Fields for Prostate Cancer
23. GammaKnife Perfexion Output Factor Measurements Using PRESAGE 3D Optical Dosimeters
24. Evaluation of the 3D dosimetry of the Nucletron MHDR-V2 Source Using PRESAGE Dosimeters
25. Investigation of 3D Dosimetry for Proton Therapy Using PRESAGE

RPC By the Numbers

These data give an idea of the scope of expert support provided by the Radiological Physics Center:

- Centers monitored worldwide: 1,942
- Centers monitored in North America: 1,686
- Beams measured each year: approximately 14,000
- Anthropomorphic phantoms mailed in 2012: 517 (2650 to date since 2000)
- Years MD Anderson has held the grant: 45 (one of the 10 oldest NCI grants)
- Physicists at MD Anderson's RPC: 6 (40 physicists have worked at the RPC)
- Photon Centers visited each year on average: 31 (since 2000)
- Proton Centers Approved for NCI clinical trials: 10
- Clinical trials in which MD Anderson's RPC has been involved: 85 (since 2005)
- Miles to the most distant center: 9,942 to Singapore