The University of Texas Graduate School of Biomedical Sciences at Houston

The University of Texas Health Science Center at Houston

The University of Texas MD Anderson Cancer Center
Making Cancer History®

MEDICAL PHYSICS GRADUATE PROGRAM ALUMNI NEWSLETTER

Volume 5 - 2011

From the Program Director:

It was another very eventful year at MDACC. As you will see in this newsletter, a new President of MDACC, Ronald A. DePinho, M.D., has been named to replace Dr. Mendelsohn when he steps down on August 31st after 15 years of service. In addition, the GSBS is seeking a new dean as is the School of Health Professions, a new Division Head of Diagnostic Imaging was named (Dr. Marshall Hicks) and the search continues for the next Division Head of Radiation Oncology, the Institution is seeking a new Sr. VP for Academic Affairs to replace Dr. Tomasovic when he retires in August 2011, and the list continues. Meanwhile, closer to the program, Geoff Ibbott was named as Chair of the Department of Radiation Physics, George Starkschall "retired" and was immediately hired back part time by the Department of Imaging Physics, and Mohammad Salehpour was elected as the new Deputy Program Director.

As always, I have many individuals to credit and thank for their commitment and the efforts that are necessary to maintain such a highly respected educational program. In particular this year, however, I would like to personally thank George Starkschall for all his dedicated service to the program as faculty member, Program Steering Committee member and very dedicated member of the Admissions Subcommittee for many years, and, of course, as Deputy Program Director.

Sincerely,
Ed Jackson

Number of Students Admitted to the Medical Physics Program:

Year	PhD Program	SMS Program
2002	5	4
2003	4	2
2004	4	2
2005	4	4
2006	6	5
2007	6	4
2008	10	8
2009	9	6
2010	12	7
2011	6	5

2011 Applicant Data for the Students Admitted to the Specialized Masters and PhD Programs:

Program	Verbal GRE	Quantitative GRE	Analytical GRE	GPA
SMS	606	714	4.5	3.44
PhD	593	757	4.3	3.43

Members of the Incoming Class for Fall 2011:

SMS in Medical Physics Program
Katie Dextraze / Georgia Institute of Technology
Olivia Huang / University of California – San Diego
Elizabeth McKenzie / Purdue University
James Neihart / Kansas State University
Matt Wait / University of North Carolina

PhD Program in Medical Physics
Scott Ingram / John Hopkins University
Tze Yee Lim / Drexel University
Rachel Martin / Harvey Mudd College
Kiley Pulliam* / UTHSC-Houston
Ashley Rubinstein / Boston University
Jackie Tonigan / UTHSC-Houston
**Started program Summer 2011*

Recent Graduates:

The following trainees completed their degree requirements in the 2010-11 academic year:

SMS in Medical Physics Program

- *Joseph Dick* – Medical Physics Services, Lakeland, FL
- *Sarah Joy* – Interviewing
- *James Kerns* - Radiation Oncology Physics Residency Program, MDACC
- *Kelly Kisling* – Jr. Medical Physicist, UTMDACC
- *Brad Lofton* – Medical Physicist, Colorado Assn in Medical Physics (CAMP), Colorado Springs, CO
- *Derek Yaldo* – Medical Physicist, Advocate Lutheran General Hospital, Park Ridge, IL

- *David Zamora* – Medical Physicist, University of Washington, Seattle, WA

(MS)PhD Program in Medical Physics

MS

- *Laura Rechner* – Physics Assistant, UTMDACC, Houston, TX

PhD

- *Ming Yang* – Radiation Oncology Physics Residency Program, MDACC

****

Feedback from alumni is always welcomed by the Program! Please send all suggestions or comments to gmoore@mdanderson.org.

****

Honors and Awards during the 2010-11 Academic Year:

Chad Bircher (Mentor: Yiping Shao)

- ❖ Finalist in the MD Anderson Alumni and Faculty Association Graduate School Award in Basic Science Research category

Richard Castillo (Mentor: Thomas Guerrero)

- ❖ Top 10 sited paper in past 2 years in Physics in Medicine and Biology – *A framework for evaluation of deformable image registration spatial accuracy using large landmark point sets*, Castillo, R., Castillo, E., Guerra, R. Johnson, V.E., McPhail, T., Garg, A.K., Guerrero, T.

John Eley (Mentor: Wayne Neuhauser)

- ❖ Recipient of DAAD Research Grant

Austin Faught (Mentor: David Followill)

- ❖ 2nd place abstract winner in the MD Anderson Alumni and Faculty Association Graduate Student Award in Clinical/Translational Research

Jason Matney (Mentor: Radhe Mohan)

- ❖ Poster Finalist for the MD Anderson Alumni and Faculty Association Graduate Student Award in Clinical/Translational Research

Adam Melancon (Mentor: Lei Dong)

- ❖ Winner of the John Cameron Young Investigator Award for 2010

Kiley Pulliam (Mentor: Stephen Kry)

- ❖ Poster Finalist for the MD Anderson Alumni and Faculty Association Graduate Student Award in Clinical/Translational Research

Sarah Scarboro (*Mentor: Stephen Kry*)

- ❖ Renewal of the American Legion Auxiliary Fellowship

Brian Taylor (Mentor: R. Jason Stafford)

- ❖ Recipient of the Aaron Blanchard Award in Medical Physics for 2011

Ming Yang (Mentor: Lei Dong)

- ❖ Finalist for the John Cameron Young Investigator Symposium for 2011
- ❖ Recipient of a PTCOG meeting travel award to be held in Philadelphia, PA

Rui Zhang (Mentor: Lei Dong)

- ❖ Feature Article" in Physics in Medicine and Biology (Volume 55 Number 23) - *An analytic model of neutron ambient dose equivalent and equivalent dose for proton radiotherapy*
- ❖ GSBS Presidents' Research Scholarship 2010-2011

Robert J. Shalek Fundraiser 11th Biennial Fundraiser

Sixty-nine M.S. and Ph.D. students have been supported by fellowships to date. In the current fundraising cycle, we have received $29,400 from 58 individuals, and $13,526 from corporations and others for a total of $42,926. The first round of letters for solicitation of donations for the 12th Biennial Fundraiser will be going out in September. If anyone has any questions on how to make a donation, they may contact Georgeanne Moore at (713) 563-2548 or by sending an email to: gmoore@mdanderson.org.

Premasters Fellowship Recipients

Fall 1989
Mike Gazda
Scott Jones

Fall 1990
Maria Graves
John Wallace

Fall 1991
Robert Praeder
Twyla Willoughby

Fall 1992
Peter Balter
Kay Jones

Fall 1993
Kyle Antes
Sarah Danielson
Dena McCowan
Donna Reeve

Fall 2002
Earl Gates
Kenneth Homann
Hilary Loupee
Claire Nerbun

Fall 2003
Blake Cannon
Scott Davidson

Fall 2004
Michael Bligh
ryan Hecox
Hilary Voss

Fall 2005
Renee Dickinson
Susannah Lazar
Alanna McDermott
Paige Nitsch

Matthew Vossler

Fall 1994
Victor Howard
Donna Reeve
Steve Thompson
Matthew Vossler

Fall 1995
Jonathan Dugan
Teresa Fischer
Russell Tarver

Fall 1996
Michael Bieda
Tamara Duckworth
Gwendolyn Myron

Fall 1997
Christopher Baird
Michael Lemacks
Luke McLemore

Fall 1998
Christopher Cherry
Dee-Ann Radford

Fall 1999
Laura Butler
Amanda Davis
Nicholas Koch
Jennifer O'Daniel

Fall 2000
Michael Beach

Fall 2001
Melinda Chi
Gary Fisher
Jackeline Santiago

Fall 2006
Maria Bellon
Jimmy Jones
Nathan Pung
Yevgeney Vinogradskiy

Fall 2007
Triston Dougall
Georgi Georgiev
Ryan Grant
Katie West

Fall 2008
Joseph Dick
James Kerns
Kelly Kisling
David Zamora

Fall 2009
Sarah Joy
Emily Neubauer
Paige Summers
Jackie Tonigan

Fall 2010
Jennelle Bergene
Kevin Casey
Jared Ohrt
Kevin Vredevoogd

Fall 2011
Olivia Huang
Elizabeth McKenzie
James Neihart
Matthew Wait

Predoctoral Fellowship Recipients

Summer 1991
John Bayouth

Fall 1994
Usman Qazq

Summer 1997
Aaron Blanchard

Summer 1998
Shannon Bragg-Sitton

Summer 1999
Nicholas Zacharopoulos

Fall 2007
Malcolm Heard

Summer 2011
Shuaiping Ge

New Program Faculty and Associates 2010-11:

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

Laurence Court, PhD, Assistant Professor, Radiation Physics

Research Interests:

- Radiation oncology
- Image-guided radiation therapy
- Adaptive radiation therapy
- Motion Management

New Program Associates

- *David Fuentes, PhD, Instructor*
- *Sunil Krishnan, MD, Associate Professor*
- *C.J. Lai, PhD, Instructor*
- *Marites "Tess" Melancon, PhD, Instructor*
- *Falk Poenisch, PhD, Assistant Professor*

Annual UTMDACC Alumni Luncheon

The Annual UTMDACC Alumni Luncheon returns this year on:

Tuesday, August 2, 2011
Pan Pacific Vancouver
Oceanview Suite 5-7
Room 111 AB
12:30 – 2:00 PM

GSBS Medical Physics Program Trainee Presentation Information for the Upcoming AAPM Meeting in Vancouver, BC

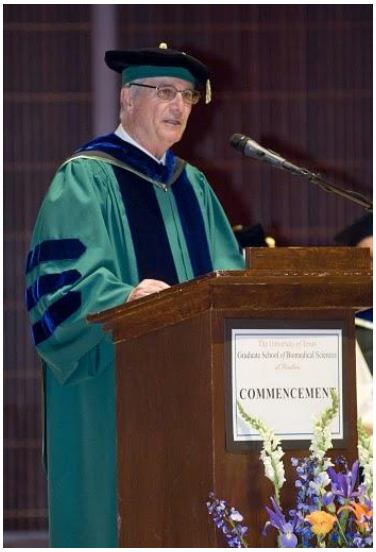
Sunday, July 31, 2011 ***Joint Imaging – Therapy Short Oral – Imaging for Therapy Assessment*** 2:15 – 3:00 PM, Ballroom C	
Patti Chen SU-D-BRC-4	Comparison of Tumor Shrinkage in Proton and Photon Therapy of Lung Cancer

Sunday, July 31, 2011 ***Imaging General Poster Discussion*** 3:00 – 6:00 PM, Exhibit Hall	
Shuaiping Ge SU-E-I-17	Evaluation of Cone Beam Breast CT (CBCT) System: Detection of Randomly Distributed Micro-Calcification and the Effect of Beam Hardening Filter
Chris Walker SU-E-I-183	Variation in Lesion Detectability of a Positron Emission Mammography (PEM) System as a Function of Breast Thickness
Sunday, July 31, 2011 ***Joint Imaging – Therapy General Poster Discussion*** 3:00 – 6:00 PM, Exhibit Hall	
Adam Yock SU-E-J-98	PTV Margin Required for Head and Neck IGRT Derived from Deformable Image Registration
Luke Hunter SU-E-J-116	New RPM Amplitude Averaging Enlarges Gross Tumor Volume in 4DCT
Emily Neubauer SU-E-J-138	The effects of Shoulder Variation on IMRT and SMART Arc Plans for Head and Neck Cancer
Sunday, July 31, 2011 ***Therapy General Poster Discussion*** 3:00 – 6:00 PM, Exhibit Hall	
Joshua Niedzielski SU-E-T-42	Changes in Submandibular Gland Volume during Radiotherapy
Rui Zhang SU-E-T-43	Calculation of the Risks of Second Cancer and Cardiac Toxicities for a Pediatric Patient Treated with Photon and Proton Radiotherapies
Annelise Giebeler SU-E-T-47	A Method to Increase Statistical Power in Micro-Clinical Trials for Second Cancers Following Advanced Techniques for Pediatric Radiotherapies
Jongmin Cho SU-E-T-153	Proton Linearity and Energy Dependence Studies of Optically Stimulated Luminescent Detectors for Remote Audits of Proton Beams Calibrations by the Radiological Physics Center
Joshua Niedzielski SU-E-T-170	Development and Testing of a Single Exposure Film Calibration Procedure
Austin Faught SU-E-T-173	Design, Development and Evaluation of a Modified Anthropomorphic, Head and Neck, Quality Assurance Phantom for Use in Stereotactic Radiosurgery
Paige Summers SU-E-T-357	Development of an Anthropomorphic Head Phantom for the Assessment of Proton Therapy Treatment Procedures
Ryan Grant SU-E-T-363	Investigation of PRESAGE® Dosimeters for Proton Therapy
Adam Yock SU-E-T-416	Geometric and Dosimetric Effects of Residual Setup Error on the Cord and Larynx in Split-Field Head and Neck Radiation Therapy
Kiley Pulliam SU-E-T-449	Clinical Impact of Couch Top and Couch Rails on Treatment Dose for IMRT and Arc Therapy
Jason Matney SU-E-T-507	Respiratory Motion Management for Early Stage Lung tumors: Is the Advantage Greater for Protons or Photons
Landon Wootton SU-E-T-523	Comparison of Fiducial and Bony-Anatomy Based Alignment for Prostate Localization in Proton Therapy
Sarah Joy SU-E-T-861	Assessment of Collimator Jaw Optimization in Reducing Normal Tissue Irradiation with Intensity Modulated Radiation Therapy
Sunday, July 31, 2011 ***John R. Cameron: Young Investigators Symposium*** 4:00 – 6:00 PM, Ballroom A	
4:20 PM Richard Castillo SU-F-BRA-3	Spatial Correlation of 4DCT Ventilation and SPECT Pulmonary Perfusion Defects in Patients with Malignant Airway Stenosis
5:50 PM Ming Yang SU-F-BRA-12	Comprehensive Uncertainty Analysis of Proton Stopping Power-Ratio Estimation using a KV-MV Dual Energy CT Scanner (DECT) for Margin Reduction
Monday, August 1, 2011 ***Imaging Scientific Session – MRI: Clinical Application & New Techniques*** 4:30 – 6:00 PM, Room, 211	
5:20 PM Ryan Bosca MO-F-211-6	Characterization of Through-Plane Flow Effects on Vascular Input Function Definition and Subsequent DCE-MRI Imaging Biomarkers
Monday, August 1, 2011 ***Therapy Scientific Session – Patient Safety and QA: Detectors and Measurements*** 4:30-6:00 PM, Room 214	
5:10 PM Sarah Scarboro MO-F-214-5	The Impact of 6MV Non-Reference Photon Energy Spectra on OSLO Response
Tuesday, August 2, 2011 ***Joint Imaging – Therapy Scientific Session – Imaging for Therapy Assessment*** 8:00 – 9:55 AM, Ballroom C	
9:40 AM Yevgeney Vinogradskiy	Use of Weekly 4DCT-Based Ventilation Maps to Quantify Changes in Lung Function for

TU-A-BRC-11	Patients Undergoing Radiation Therapy
Tuesday, August 2, 2011 ***Therapy Scientific Session – Treatment Planning Optimization*** ***8:00 – 9:55 AM, Ballroom B***	
8:30 AM Peter Park TU-A-BRB-4	Incorporating Beam-Specific Target Volumes Into Beam Angle Selection in Proton Therapy
Tuesday, August 2, 2011 ***Therapy Scientific Session – Treatment Delivery & Verification: Protons and Other Heavy Particles*** ***4:30 – 6:00 PM, Ballroom B***	
4:30 PM Jessie Huang TU-G-BRB-1	Investigation of Dose Perturbations and Radiographic visibility of Potential Fiducials for Proton Radiation Therapy of the Prostate
5:10 PM Yoshi Tsunashima TU-G-BRB-5	Dosimetric Characterization of Motion Effect in Delivery Uniform Target Dose Distribution using Scanning Proton Beams
Wednesday, August 3, 2011 ***Therapy Scientific Session – Treatment Delivery Verification: Intensity-Modulated Photons*** ***10:30-12:30 AM, Ballroom B***	
10:30 AM Jackie Tonigan WE-C-BRB-1	Does IMRT Treatment Plan Complexity or Mismatched Dosimetry Data Contribute to Dose Delivery Errors Detected using an IMRT H&N Quality Assurance Phantom?
Wednesday, August 3, 2011 ***Therapy Scientific Session – Treatment Delivery Verification: Intensity-Modulated Photons*** ***2:00 – 3:50 PM, Ballroom B***	
2:00 PM Daniel Robertson WE-E-BRB-1	Voxelized Quenching Correction for Proton Pencil Beam in a Liquid Scintillator Detector
Wednesday, August 3, 2011 ***Therapy Scientific Session – Modeling of Therapy Outcome*** ***4:30 – 6:00 PM, Ballroom A***	
4:50 PM Laura Rechner WE-G-BRA-3	Risk of Second Malignant Neoplasma following VMAT and Proton Arc Therapy for Prostate Cancer
Thursday, August 4, 2011 ***Joint Imaging – Therapy Scientific Session – Motion Management for Treatment Delivery*** ***10:30-12:30 PM, Ballroom C***	
11:50 AM John Eley TH-C-BRB-9	Tracking Moving Tumors with a Scanned Carbon Bram: Robustness to Changing Target Motion Characteristics and Tracking Uncertainties

The Program thanks Dr. Radhe Mohan for his support during his tenure as Chair of the Department of Radiation Physics.

Selected 2011 GSBS Graduation Highlights



Dr. George Stancel has announced that he is stepping down as dean. He was appointed Dean of The University of Texas Graduate School of Biomedical Science at Houston in May 1999. During his tenure, the Graduate School of Biomedical Sciences has, in collaboration with MD Anderson and UT-Health, created a phenomenal environment for graduate students. Dean Stancel has served his school impeccably for many years and built a great legacy during his tenure. The search for his successor is ongoing.

Brian Taylor receives his doctoral diploma

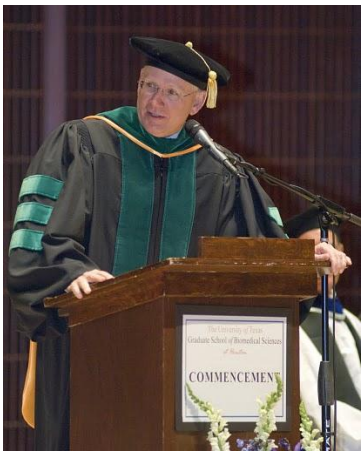
Graduation reception

Scott Davidson receives his doctoral diploma from Dean, Dr. George Stancel

Blake Cannon all smiles while he receives his doctoral diploma from Dr. Giuseppe N. Colasurdo, MD and Dr. Raymond N. DuBois, MD, PhD

Laura receives her MS diploma from Dr. Stancel

Music provided by Ambient Arts Brass



UTMDACC Provost, Dr. Dubois, addressing new graduates

Dr. Neuhauser gets a little help from Brenda Gaughan

****

Our sincere thanks to our alumni, current students, faculty, and staff for another successful year for the Medical Physics Program!

****

2011 Graduate School Association Olympics

Special thanks to Jongmin Cho for providing the photos of the 2011 Olympics. The Medical Physics Program Team did us proud as the winners of the dodge ball and basketball competitions. A good time was had by all participants.

Moiz Ahmad and Austin Faught in the Wheelbarrow Race

Mitchell Carroll throwing the frisbee

Jongmin Cho, Mitchell Carroll, and Timothy Jones in extreme pipetting.

Jennelle Bergene playing a game of dodge ball

Daniel Smith and Christopher MacLellan in a friendly(?) game of dodgeball

Paige Summers and Jackie Tonigan competing in the two-legged race

Auston Faught takes his basketball very seriously and gets a little assistance from Paige Summers

Jennelle Bergene, Tim Jones, Shuaiping Ge, and Jessie Huang planning their strategy for the next event

Third Annual Medical Physics Student Retreat

On Friday, July 22, 2011, the third annual Medical Physics Program Graduate Student Research Retreat will be held at the Main Campus facility. The retreat will again be funded by the M.D. Anderson Cancer Center Graduate Education Committee (GEC), with the support of the Executive Vice President and Provost, Dr. Raymond DuBois. The goal of the retreat is to encourage program students to organize a day-long retreat that allows them to exchange information about their individual research projects and to interact with an external leader in the field. This year, the external leader is Dr. Jatinder Palta, from the University of Florida.

M.D. Anderson has named a new president…

AUSTIN -- The University of Texas System Board of Regents today (June 9) named Ronald A. DePinho, M.D., president of the UT MD Anderson Cancer Center in Houston.

The Board announced Dr. DePinho, a Harvard professor and cancer institute administrator, as president following a special called meeting of regents. Dr. DePinho had been named the sole finalist for the post last month. Texas law requires university governing boards to name a finalist or finalists at least 21 days prior to their selection as president. He will begin his duties as president on Sept. 1.

"We are pleased to bring on board Dr. DePinho, whose credentials as a distinguished scientist and administrator at a prestigious cancer institute make him an outstanding choice to lead the nation's premiere comprehensive cancer center, UT MD Anderson," Regents' Chairman Gene Powell said. "Dr. DePinho has demonstrated extraordinary talent and his vast experience will make him an effective administrator for this complex medical institution."

Dr. DePinho is the director of the Belfer Institute for Applied Cancer Science at the Dana-Farber Cancer Institute and professor of medicine (genetics) at Harvard Medical School. Dr. DePinho, a member of the Institute of Medicine of the National Academies and fellow of the American Academy of Arts and Sciences, previously held numerous faculty positions at the Albert Einstein College of Medicine in New York. He received a bachelor's degree in biological sciences from Fordham College and his medical degree with distinction in microbiology and immunology from the Albert Einstein College of Medicine. Dr. DePinho's research interest is in the genetic aspects of cancer and the translation of such knowledge into clinical endpoints. He has authored and peer reviewed hundreds of scientific journals and articles.

"Dr. DePinho's talents and experience make him an ideal choice to lead UT MD Anderson," UT System Chancellor Francisco G. Cigarroa, M.D., said. "It is because he has such deep understanding of the impact of cancer research at the patient's bedside – and of the complexities of cancer care – that he is so well suited to the responsibilities of leading the nation's, and in my opinion the world's, most revered cancer center."

"It is with great pride that I have accepted this solemn responsibility as it is my belief that MD Anderson – armed with its scientific and clinical brilliance, determined spirit, and singular focus on cancer – is supremely positioned to make major progress in the prevention, detection and treatment of this disease," Dr. DePinho said. "This is a special moment in the

history of cancer science and medicine, marked by a confluence of deep knowledge and innovative technologies capable of illuminating cancer's complexities. These advances, coupled with the enormous scientific and clinical power of MD Anderson, have positioned us to make a decisive assault on this dreaded disease."

Dr. DePinho's wife, Lynda Chin, M.D., also will join the faculty of UT MD Anderson. Dr. Chin is the scientific director of the Belfer Institute for Applied Cancer Science at the Dana-Farber Cancer Institute and professor of dermatology at the Harvard Medical School and department of medical oncology at Dana-Farber Cancer Institute. She received her medical degree from the Albert Einstein College of Medicine and her research interest is in cancer genomics and cancer biology.

Dr. DePinho will succeed Dr. John Mendelsohn, who announced last December his plans to step down as president. Mendelsohn, who has served as the president of the institution for the past 15 years, will remain on the faculty, returning to clinical and translational research as co-director of its new Institute for Personalized Cancer Therapy (IPCT). During his tenure as president, Mendelsohn greatly expanded UT MD Anderson's clinical and research programs, and the institution has become widely acknowledged as the nation's number one cancer center.

2011 Highlights from the Department of Imaging Physics

New Personnel

Faculty Promotions

- **James A. Bankson, PhD,** Associate Professor, Magnetics Resonance Systems Laboratory
- **David T. A. Fuentes,** Instructor, Magnetic Resonance Systems Laboratory
- **A. Kyle Jones, PhD,** Assistant Professor, Section of Radiological Physics
- **Jingfei Ma, PhD,** Professor, Section of MR and Ultrasound Physics
- **Osama Mawlawi, PhD,** Professor, Section of Medical Nuclear Physics
- **Marites Melancon, PhD**, Instructor, Magnetic Resonance Guided Therapy Laboratory

Classified Positions

- **Gloria Mendoza,** Promoted to Program Coordinator
- **Rashonda Reed**, Program Director, Research
- **Lisa M. Watson,** Administrative Assistant

Honors and Awards

- **Osama Mawlawi, PhD,** Named President, American Board of Science in Nuclear Medicine

Research Updates

Funded Grants:

- CPRIT - RP101243-P05 (Project PI: Bankson): Project 5: Fast Imaging Methods for Hyperpolarized Nuclei, 08/01/2010 - 07/31/2013, $760,757 direct costs
- CPRIT – RP100934 (PI: Gascoyne): Antibody-Free Microfluidic Isolation and Molecular Analysis of Circulating Cancer Cells, 05/01/2010 – 04/30/2013, $868,022 direct costs
- Apocell – SR2010-00030949RG (PI: Gascoyne): Validation of DEP-FFF for Isolating Circulating Tumor Cells from Blood, 08/24/2010 – 08/31/2012, $214,874 direct costs
- MDA IRG – (PI: Mawlawi): Standardization of PET Quantifications across Different Image Acquisition, Processing Parameters and Scanner Platforms, 04/01/2010 – 03/31/2012, $50,000 direct costs
- NIH/NCI – P50CA097007 (Career Development Project PI: Melancon): Targeted Nano-shell-Based Agent for MRI-Guided Thermal Ablation of Recurrent Head and Neck Cancer, 09/30/2010 – 07/31/2011, $100,000 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
- 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
- NIH/NCI – R01CA151372 (Subcontract PI: Stafford): Nanoparticle-Directed Photothermal Ablation of Primary Brain Tumors guided by Magnetic Resonance Thermal Imaging, 07/12/2010 – 04/30/2013, $150,875 direct costs
- NIH/NCI – R21EB010196 (PI: Stafford): Prospective 3D Treatment Planning for MR-Guided

Laser Induced Thermal Therapy Procedures, 09/01/2010 – 08/31/2012, $250,000 direct costs

- NIH/NCI – R43CA150601 (Subcontract PI: Wendt): A New Radiopharmaceutical for the Treatment of Metastatic Bone Cancer, 09/27/2010 – 09/26/2011, $11,503 direct costs

- Gabriel Institute, Inc. (PI: Wendt): A Collaborative Medical Research Agreement regarding the Development of Requirements for a Treatment Planning System for Liquid Brachtherapy, 12/17/2010 – 03/17/2011, $6,390 direct costs

Imaging Physics Residency Program

The program now has a total of five residents.

- Andreea Dohatcu, PhD – started the program July 2009 and will be completing on August 31, 2011.
- Wendy Siman, MS – started the program February 2010 and is now in his second year of residency.
- James Winslow, PhD – started the program August 2009 and will be completing the program this August. Dr. Winslow has accepted position with Duke University under the mentorship of Dr. Ehsan Samei.
- Ching-Yi Hsieh, MS – joined the program August 2010 and is nearing completion of his first year.
- Shannon Fritz, PhD –joined the program this past May and comes to us from the LSU Medical Physics Program.

The residency program is honored to be named the recipient of the AAPM/RSNA Diagnostic Imaging Residency Fellowship Award. This award will allow us to keep a 5th residents in the program for the next two years.

Imaging Physics Resident Presentation Information for the Upcoming AAPM Meeting in Vancouver, BC

Sunday, July 31, 2011 ***Imaging General Poster Discussion*** 3:00 – 6:00 PM, Exhibit Hall	
James Winslow SU-E-1-14	Image Quality and Patient Dose Dependence on CT Scan Parameters for ATCM (Care Dose 4D
Wendy Siman SU-E-1-64	Weekly Exposure Contributions from Radioactive Patients in a Busy Comprehensive Imaging Center
Travis Greene SU-E-120	Automated Analysis of MRI Ratio Frequency Coil Performance

2011 Highlights from the Department of Radiation Physics

Honors and Awards

- **Michael Gillin, Ph.D. –** Named Fellow, American Society for Radiation Oncology.
- **Lei Dong, Ph.D.** – Named Deputy Chair and Director, Advanced Technology Applications, Radiation Physics.
- **David Followill, Ph.D.** – Named Director, Radiological Physics Center, Radiation Physics.
- **David Followill, Ph.D.** – Named Chief, Section of Outreach Physics.
- **Mohammad Salehpour, Ph.D. –** Named Director of Education, Radiation Physics
- **Mohammad Salehpour, Ph.D. –** Elected Deputy Director of GSBS Medical Physics program
- **Mohammad Salehpour, Ph.D. –** Elected to Executive Committee of the Faculty Senate
- **Geoffrey Ibbott, Ph.D**. – Received Randall S. Caswell award from the Council on Ionizing Radiation Measurements and Standards
- **Geoffrey Ibbott, Ph.D.** – Featured in Summer 2010 issue of *Conquest* – "Radiological Physics Center Ensures Strength, Applicability of Clinical Trial Results".
- Article published in *Journal of Medical Case Reports*, October 19, 2010 with 1,100 downloads within the first two months of publication:
  - Bouthaina S Dabaja, Kelly J Perrin, Jorge Romaguera, Patricia Horace, Christine F. Wogan, Ferial Shihadeh and **Mohammad R Salehpour, Ph.D** "Successful treatment of a free-moving abdominal mass with radiation therapy guided by cone-beam computed tomography: a case report".
- Manuscript selected as Editor's Choice, *MedicalPhysicsWeb,* November 15, 2010:
  - **Phillip Taddei, Ph.D., Rebecca Howell, Ph.D.,** S. Krishman, **Sarah Scarboro, Ph.D., Dragon Mirkovic, Ph.D., Wayne Newhauser, Ph.D.** "Risk of second malignant neoplasm following proton versus intensity-modulated photon radiotherapies for hepatocellular carcinoma
- Articles published in *Physics in Medicine and Biology* Highlights of 2010 (PMB) and featured in *www.medicalphysicsweb.org*:

- **Wayne Newhauser, Ph.D., Phillip Taddei, Ph.D.,** Anita Mahajan**, Dragan Mirkovic, Ph.D., Rui Zhang, Annelise Giebeler,** David Kornguth**,** Mark Harvey, and Shiao Woo **–** "Predicted risks of second malignant neoplasm incidence and mortality due to secondary neutrons in a girl and boy receiving proton craniospinal irradiation".
- **Firas Mourtada, Ph.D.,** Oleg N Vassiliev, Todd A Wareing, John McGhee, Gregory Failla, **and Mohammad R. Salehpour, Ph.D. -** "Validation of a new grid-based Boltzmann equation solver for dose calculation in radiotherapy with photon beams".
- **Radhe Mohan, Ph.D., Stephen Kry, Ph.D. and** Oleg N Vassiliev **–** "Out-of-field photon dose following removal of the flattening filter from a medical accelerator".

- Publication selected as May *Editor's Highlight* paper in both Nanoscale Science and Biological Science, by the American Institute of Physics, selected for Publication in AIP *Virtual Journal of Nanoscale Science & Technology*, May 23, 2011 and the AIP *Virtual Journal of Biological Physics Research*, May 15, 2011:
  - **Jerimy Polf, Ph.D.**, L Bronk, W Driessen, W Arap, R Pasqualini, **Michael Gillin, Ph.D**, "Enahnced Relative biological effectiveness of proton radiotherapy in tumor cells with internalized gold nanoparticles". Appl Phys Letters 98:193702(1-3).

- **Rui Zhang, Graduate Research Assistant –** Awarded Presidents' Research Scholarship for his doctoral thesis work on novel cardiac toxicity and second cancer after proton therapy and IMRT.
- **Rui Zhang, Graduate Research Assistant –** Awarded GSBS and Cancer Answer Foundation's Andrew Sewell-Wade Huggins Scholarship in Cancer Research
- **Drs**. **Heng Li, Julianne Pollard, Xin Wang, Zhifei Wen** – passed ABR Boards.

New Personnel

Faculty

- **Julianne Pollard, Ph.D.,** Instructor
- **Xin Wang, Ph.D.,** Assistant Professor
- **Falk Poensich, Ph.D**., Assistant Professor
- **Kelly Kisling, MS,** Junior Medical Physicist (RCC)
- **Michalis Aristophanous, Ph.D.,** Instructor
- **Yelin Suh, Ph.D.,** Instructor
- **Zhifei Wen, Ph.D.,** Assistant Professor

Classified

- **Nicholas Murray,** Physics Assistant
- **Regina Gutierrez,** Physics Assistant
- **Sarah Willis,** Radiological Physics Tech I
- **Charles Darcy-Clarke,** Radiological Physics Tech I
- **Amy Liu,** Computational Scientist
- **Rechelle Tull,** Radiological Physics Tech I
- **Luster "Po" McDaniel,** Accelerator Technician III
- **Laura Rechner,** Physics Assistant
- **Matt Kerr,** Physics Assistant
- **Charles Holmes,** Physics Assistant
- **Scott Drews,** Accelerator Technician II
- **Kayla White,** Executive Assistant
- **Deborah Mann,** Administrative Assistant

Hired but not on board yet:

- **Yoshifumi Hojo Ph.D.**
- **Mark Garcia, MS**
- **George Zhao, Ph.D.**
- **Laura Rechner, MS,** Jr. Medical Physicst

Faculty Promotions:

- **Laurence Court, Ph.D.,** to Tenure Track
- **David Followill, Ph.D.,** to Professor
- **Heng Li, Ph.D.,** Assistant Professor
- **Mohammad Salephour, Ph.D.,** to Professor
- **James Yang, Ph.D.,** to Associate Professor
- **Song Gao, Ph.D.**, to Assistant Professor

Classified

Luster "Po" McDaniel, Accelerator Technician III

Major Achievements in Radiation Physics Research

- Cancer Prevention Research Institute of Texas (PI: Laurence Court, PhD) Quality Assurance Core
- Cancer Prevention Research Institute of Texas (PI: Lei Dong, Ph.D.) Advanced Volumetric Imaging & Adaptive Radiotherapy for Detecting & Correcting for Inter-fractional Changes
- Philips (PI: Peter Balter, Ph.D.) Master Research Agreement
- Massachusetts General Hospital Subcontract (PI: David Followill, Ph.D.) Development of Standard Operating Procedures for Dosimetry Validation & Accreditation of Proton Therapy Centers
- Varian Research Agreement (PI: Laurence Court, Ph.D.) Clinical Advantages of Treating Patients in an Upright Position
- Varian Research Agreement (PI: Anita Mahajan, M.D. Co-PI Lei Dong, Ph.D.) Deformable Image Registration for Normal Brain Structure Delineation with Dose Correlation for Normal Tissue Toxicities in Adult & Pediatric Patients Receiving Proton Radiotherapy to the Brain
- Varian Research Agreement (PI: Firas Mourtada, Ph.D.) Varian Eclipse Acuros XB Evaluation

- MDA Sister Institution Network Fund (PI: Radhe Mohan, Ph.D.) Intensity Modulated Particle Therapy

Radiological Physics Center

Section of Outreach Physics

Radiological Physics Center – Funding sources

- The RPC grant was successfully renewed this past year. Even though a 6 year period was asked for, only 3 years was granted. This is due to the reorganization of the clinical trial program sponsored by NCI. All trial groups will have to consolidate and reapply in 2012. 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, 7/1/2007−6/30/2012, $409,901 ($81,980/year)
- Veterans Administration, National Medical Physics Peer-Review of Radiation Therapy Quality Assurance Operations, 9/27/2010-9/26/2013, $740,718 ($246,906/year)
- Massachusetts General Hospital, Development of Standard Operating Procedures for Dosimetry Validation and Accreditation of Proton Therapy Centers, 4/1/2011-12/31/2011, $618,929 ($618,929/year)
- 1,833 active institutions now being monitored, including 35 in Canada, 108 elsewhere in the world. RPC phantoms have been irradiated successfully by more than XXXX institutions for IMRT and SBRT protocols, up from 1022 last year at this time. Our experience still shows that still about 1/5 of institutions fail to irradiate the IMRT H&N phantom according to their own treatment plans.
- The RPC has audited 5 proton facilities. All 9 USA clinical sites have irradiated TLD (including one in Japan) and a visit has been conducted to six sites and clinical trial credentials have been given to five sites.
- Geoff Ibbott became the Chairman of the Department of Radiation Physics at MDACC. David Followill became the new PI and Director of the RPC as of October 2010.
- The RPC moved from its previous location on Main St to newly renovated space on El Rio St. The location is a bit farther from the main hospital but workflow efficiency has increased and rent costs have decreased.
- With the additional VA funding we have been able to add an additional medical physicist in addition to replacing Geoff Ibbott. Stephen Kry, PhD joined the RPC in March 2011 and Paige Summers will join us this September 2011.

Other projects within the RPC

RPC staff and students are presenting their work on the following 18 topics at this meeting. Most projects are collaborations with staff or faculty in the Departments of Radiation Physics and Diagnostic Imaging Physics; at Washington University, UT Southwestern Health Science Center, Duke University Medical Center, Thomas Jefferson University, Princess Margaret Hospital; or at several industrial partners*:*

QA of Helical Tomotherapy TG-148, *K Langen, N Papanikolaou, J Balog, R Crilly, D Followill, S Goddu, W Grant, G Olivera, C Ramsey, C Shi*

Evaluation of Lung Treatment Deliveries Using the Radiological Physics Center's (RPC) Thorax Phantom: Monte Carlo Heterogeneity Correction Algorithms Vs. All Other Modern Heterogeneity Correction Algorithms, *D Followill, P Alvarez, A Molineu, M Gillin, G Ibbott*

Analysis of Uncertainties for the RPC Remote Dosimetry Using Optically Stimulated Light Dosimetry (OSDL), *J Aguirre, P Alvarez, G Ibbott, D Followill*

Development of An Anthropomorphic Head Phantom for the Assessment of Proton Therapy Treatment Procedures, *P Summers, D Followill, N Sahoo, F Poenisch, S Tucker, M Gillin, B Riley, G Ibbott*

Does IMRT Treatment Plan Complexity Or Mismatched Dosimetry Data Contribute to Dose Delivery Errors Detected Using An IMRT H&N Quality Assurance Phantom?, *J Tonigan, S Kry, L Dong, T Purdie, R White, G Ibbott, D Followill*

Dosimetric Verification of Deterministic Acuros XB Radiation Transport Algorithm for IMRT and VMAT Plans with the RPC H&N Phantom, *T Han, F Mourtada, K Kisling, J Mikell, D Followill, R Howell*

The Impact of 6MV Non-Reference Photon Energy Spectra On OSLD Response, *S Scarboro, D Followill, J Kerns, S Kry*

Clinical Impact of Couch Top and Couch Rails On Treatment Dose for IMRT and Arc Therapy, *K Pulliam, R Howell, D Followill, D Luo, R White, S Kry*

Design, Development, and Evaluation of a Modified, Anthropomorphic, Head and Neck, Quality Assurance Phantom for Use in Stereotactic Radiosurgery, *A Faught, S Kry, D Luo, A Molineu, J Galvin, R Drzymala, R Timmerman, J Sheehan, M Gillin, G Ibbott, D Followill*

Requirements for Performing a Retrospective Patient Chart Review at the Radiological Physics Center (RPC) for Clinical Trials, *A Hollan, J Lowenstein, I Harris, F Hall, J Roll, D Followill*

Modification and Implementation of the RPC Heterogeneous Thorax Phantom for Verification of Proton Therapy Treatment Procedures, *A Blatnica, G Ibbott, X Zhu, P Balter, R White, D Followill*

Cervix Brachytherapy Dosimetry: Inconsistencies in Defining Bladder and Rectal Points, *J Lowenstein, J Roll, I Harris, F Hall, A Hollan, D Followill*

Results From 1005 IMRT Irradiations of An Anthropomorphic Head and Neck Phantom, *A Molineu, N Hernandez, P Alvarez, G Ibbott, J Galvin, D Followill*

Investigation of PRESAGE® Dosimeters for Proton Therapy, *R Grant, G Ibbott, X Zhu, M Carroll, J Adamovics, M Oldham, D Followill*

Analysis of Results From An Anthropomorphic Stereotactic Radiosurgery Phantom, *C Amador, A Molineu, S Smith, N Hernandez, D Followill, M Stovall*

Evaluation of the OSLD System for Remote Dosimetry Audits Implemented by the RPC, *P Alvarez, J Aguirre, D Followill*

Proton Linearity and Energy Dependence Studies of Optically Stimulated Luminescent Detectors for Remote Audits of Proton Beam Calibrations by the Radiological Physics Center, *J Cho, P Alvarez, D Followill, M Gillin, G Ibbott*

Angular Dependence of the NanoDot Dosimeter, *J Kerns, S Kry, N Sahoo, D Followill, G Ibbott*

Accredited Dosimetry Calibration Laboratory (Geoffrey Ibbott, PhD)

The MD Anderson ADCL successfully completed a reaccreditation site visit last year as required by our compliance with the AAPM accreditation program. Since then, we have continually improved our quality management system and implemented strong marketing efforts which have yielded successful gains in our customer base, including both new and returning customers. Furthermore and most importantly, we have established and worked towards new business-directed goals that are focused on sustaining our position within our institution as well as increasing our contributions to our academic and professional communities.

Radiation Dosimetry Services (Marilyn Stovall, Ph.D.)

Over 1,500 active institutions. Services offered: check of machine output for photon and electron beams and check of blood irradiators.

Stereotactic radiosurgery phantom services are handled by the MDADL as of June 1st.

Education (Mohammad Salehpour, Ph.D.)

Postdoctoral Fellows

Since the last report, two postdoctoral fellows have completed their appointments and gone on to further their careers.

- **Angelica Perez-Andujar, Ph.D.** (*Newhauser*) accepted a job in California.
- **Lilie Wang, Ph.D.** *(Beddar)* is going to Stanford.
- One new postdoctoral fellow will join the Department this year: **Slade Klawikowski, Ph.D.** *(Ibbott)*.

We welcome our new and postdoctoral fellow.

Radiation Physics Residency Program

The program has a total of five residents:

- **Xiaoning Pan, Ph.D.,** will be joining the Department of Radiation Oncology at the UT Health Science Center at Tyler, TX, as an Assistant Professor in July.
- **Heeteak Chung, Ph.D.,** has been offered an Assistant Professor position at the University of Maryland starting in July.
- **Adam Melancon, Ph.D.,** joined the program in June 2010.
- **James Kerns, M.S.,** joined the program in September 2010.
- **Aman Anand, Ph.D.,** joined the program in January 2011.

We wish Drs Pan and Chung success in their careers.

All three residents graduated in 2010 (Xin Wang, Heng Li, Julie Pollard) passed ABR part III in 2011.

Two new radiation physics residents will join the Program this summer: Ming Yang , Ph.D.,

(GSBS Medical Physics Program) and Abbie Wood, Ph.D. (Univ. of Chicago Medical Physics Program). We welcome our new residents.

Proton Physics Fellowship Program

The Proton Fellowship Program is under the direction of **Narayan Sahoo, Ph.D. Falk Pönisch, Ph.D.** completed the program in June 2010 and joined the Department of Radiation Physics as an Assistant Professor and **Xioafei Song, Ph.D. continued as a** second year Fellow. **Zhifei Wen, Ph.D**. joined as a fellow in August 2010. After about nine months in the Fellowship, Dr. Wen joined the Department of Radiation Physics as an Assistant Professor. Ms. **Sandeep Dhanesar, M.Sc.** (Doctoral Candidate, ABD) from Queen's University in Canada has been selected as the new Proton Physics Fellow. **Xiaofei Song, Ph.D.** will continue as a third year Proton Physics Fellow. This program, to our knowledge the first of its kind, is designed to provide specialized clinical training to physicists interested in proton radiation therapy. The clinical physics group and the Proton Therapy center greatly appreciate the contributions made by our Proton Physics Fellows and wish them the very best of success in their future endeavors.