

CURRICULUM VITAE

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I. EDUCATION:

<u>DATE</u>	<u>INSTITUTION</u>	<u>DEGREE</u>
09/2010-07/2015	Dartmouth College	Ph.D. in Physics
09/2006-07/2010	University of Science and Technology of China (USTC)	B.S. in Physics and Optics

II. TRAINING:

<u>DATE</u>	<u>INSTITUTION</u>	<u>SPECIALTY</u>
07/2015-07/2018	Harvard Medical School	Medical Physics Residency
07/2015-01/2017	Massachusetts General Hospital	Medical Physics Residency
02/2017-04/2018	Brigham Women's Hospital	Medical Physics Residency
05/2018-06/2018	Beth Israel Deaconess Medical Center	Medical Physics Residency

III. ACADEMIC APPOINTMENTS:

<u>DATE</u>	<u>INSTITUTION</u>	<u>TITLE</u>
10/2019-present	Geisel School of Medicine at Dartmouth	Assistant Professor of Medicine (Radiation Oncology)
10/2019-present	Thayer School of Engineering at Dartmouth	Adjunct Assistant Professor of Engineering
07/2018-10/2019	Winship Cancer Institute at Emory University	Assistant Professor of Radiation Oncology

IV. LICENSURE AND CERTIFICATION:

<u>DATE</u>	<u>LICENSURE/CERTIFICATION</u>
05/2021-present	American Board of Radiology
05/2021-present	State of New Hampshire License #130R (Qualified Medical Physicist)
07/2018	Harvard Certificate Program in Medical Physics

V. HOSPITAL APPOINTMENTS:

<u>DATE</u>	<u>INSTITUTION</u>	<u>POSITION/TITLE</u>
10/2019-present	Dartmouth-Hitchcock Medical Center	Clinical Physicist II
07/2018-10/2019	Emory University Hospital and Emory Proton Therapy Center (EPTC)	Clinical Physicist

VI. TEACHING ACTIVITIES:

<u>DATE</u>	<u>COURSE/ACTIVITY</u>	<u>ROLE</u>	<u>FREQUENCY/HOURS</u>
2022-present	Medical Imaging	Lecturer	Yearly/6
2021-present	Dartmouth Radiation Oncology Open House	Lecturer	Yearly/2
2021-present	Radiation Oncology Resident Orientation	Faculty	Yearly/3
2021-present	Medical Physics Practicum	Faculty	Yearly/2

2020-present	ENG-192 Radiation Therapy Physics	Faculty	Yearly/2
2019-present	ENG-168 Radiation Transport	Faculty	Yearly/20
2019-present	AI medical imaging journal club	Faculty	Bi-weekly/1
2019-present	Biomedical imaging journal club	Faculty	Bi-weekly/1
2019-present	NCCC translational engineering program	Member	Monthly/1
2018-2019	Radiation Therapy Physics	Faculty	Yearly/4
2018-2019	Medical Imaging	Course director/Faculty	Yearly/22

VII. STUDENT/FELLOW ADVISING/MENTORING:

<u>DATE</u>	<u>NAME OF STUDENT/Fellow</u>	<u>ROLE</u>	<u>PROGRAM</u>
2021-present	Austin Sloop	Thesis Committee	Dartmouth Medical Physics Education Program
2022-present	Drew Bergman	Project Advisor	Geisel Medical Student
2021-present	Jacob Sunnerberg	Thesis Committee	Dartmouth Medical Physics Education Program
2021-present	Savannah Decker	Thesis Committee	Dartmouth Medical Physics Education Program
2021-present	Arthur Petusseau	Thesis Committee	Dartmouth Medical Physics Education Program
2019-2021	Dr. Brady Hunt	Post Doc Advisor	Post-Doctoral Fellowship Engineering/RadOnc
2019-present	Zhong Han	Thesis Advisor	Dartmouth Medical Physics Education Program
2019-2022	Dr. Mahbubur Ronny Rahman	Thesis Advisor	Dartmouth Medical Physics Education Program
2019-present	Dr. Daniel Alexander	Thesis Committee	Dartmouth Medical Physics Education Program
2019-2021	Dr. Muhammad Ramish Ashraf	Thesis Committee	Dartmouth Medical Physics Education Program
2019-2021	Dr. Rachael Hachadorian	Thesis Committee	Dartmouth Medical Physics Education Program
2019-2020	Aris Rassias	Project Co-Advisor	Dartmouth Undergraduate Research
2018-2020	Dr. Luke Maloney	Thesis Committee	Georgia Tech Medical Physics Education Program
2018-2019	Dr. Joseph Harms	Project Advisor	Emory Medical Physics Residency
2018-2019	Dr. Serdar Charyyev	Project Advisor	Emory Medical Physics Residency
2018-2019	Alexander Stanforth	Project Advisor	Emory Medical Physics Assistant
2014-2015	Oscar Friedman	Project Advisor	Dartmouth Undergraduate Research

2013-2014	William Voigt	Project Advisor	Dartmouth Undergraduate Research
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VIII. RESEARCH FUNDING:

A. Current

<u>DATE</u>	<u>PROJECT</u>	<u>ROLE/% EFFORT</u>	<u>SPONSOR</u>	<u>ANNUAL DIRECT COST</u>
01/2022- 12/2022	The first dedicated electron FLASH irradiator in North America: DH-FLASH	Co-PI	DH capital /NCCC /Thayer	\$750,000
01/2022- 12/2022	Epigenetic mechanisms of FLASH radiation effects	Co-I	Cancer Center Developmental Funds	\$25,000
09/2021- 08/2022	Ultra-fast imaging for the safe delivery of electron FLASH radiation therapy 1R43CA268466-01	Subaward PI/5%	NIH	\$23,249
08/2021- 07/2022	Everyday Use of Optical Cherenkov Imaging Identifies Adverse Events and Opportunities for Improved Radiation Treatment 1R44CA265654-01	Subaward PI/5%	NIH	\$57,150
06/2021- 05/2022	Treatment Planning and Delivery Optimization of Electron Ultra-High Dose Rate Radiation Therapy (eFLASH-RT)	PI	Dartmouth Scholarship Enhancement in Academic Medicine Award	\$25,000
08/2020- 07/2022	Optimizing MRI-Guided Real-Time On-Table Adaptive Radiation Therapy (MR-ROaRT) with Deep Learning	PI	Dartmouth Scholarship Enhancement in Academic Medicine Award	\$25,000

B. Pending

<u>DATE</u>	<u>PROJECT</u>	<u>ROLE/% EFFORT</u>	<u>SPONSOR</u>	<u>ANNUAL DIRECT COST</u>
04/2022- 03/2023	Photodynamic Normal Tissue Sparing in Radiation Therapy	PI	NCCC ACS Pilot	\$30,000
04/2022- 03/2023	Real-time cardiac and respiratory motion tracking during radiation therapy to reduce cardiac toxicity in patients with non-small cell lung cancer	Co-I	NCCC ACS Pilot	\$30,000
04/2022- 03/2023	Deep learning assisted segmentation of brain tumors and organs-at-risk for increased	Co-I	Dartmouth Scholarship Enhancement in Academic	\$25,000

	efficiency in radiation therapy treatment planning workflows		Medicine Award	
09/2022-08/2024	Treatment Planning System Deployed with Electron UHDR Linacs for the Clinical Translation of FLASH-RT	PI/15%	NIH	\$135,000
2022-2023	Epigenetic mechanisms of the FLASH radiotherapy effect	PI & Advisor /In-kind	RSNA	\$6,000
09/2022-08/2027	Optimization of MeV FLASH radiotherapy for normal tissue preservation	Subaward PI/10%	NIH	\$77,413
01/2023-12/2027	Biophysical Modeling of Neuroinflammation Associated with Cognitive Changes Following FLASH Electron Irradiation in Healthy and Tumor-Bearing Mice for Optimizing Brain Cancer Treatments	Subaward PI/5%	NIH	\$20,324
07/2022-06/2025	Color Cherenkov Imaging for Non-contact Absolute Dosimetry in Humans	Subaward PI/10%	NIH	\$44,774
04/2022-03/2027	Novel dose rate optimization and treatment planning system for clinical FLASH-RT	Consultant	NIH	\$25,000
04/2022-03/2027	Translational FLASH Radiotherapy	Co-PI/15%	NIH	\$500,000
10/2021-09/2026	Simultaneous dose and dose rate optimization for clinical FLASH proton radiotherapy	Subaward PI/5%	NIH	\$46,091
10/2021-09/2026	Optimization of MeV FLASH radiotherapy for normal tissue preservation	Co-I/10%	NIH	\$600,000
06/2022-06/2027	Imaging & Control of eFLASH, deployable to conventional linacs	Co-PI/10%	NIH	\$500,000

C. Completed

<u>DATE</u>	<u>PROJECT</u>	<u>ROLE/% EFFORT</u>	<u>SPONSOR</u>	<u>ANNUAL DIRECT COST</u>
02/2021-01/2022	FLASH Radiotherapy Treatment of Spontaneous Canine Tumors	PI	Cancer Center Developmental Funds	\$60,000
08/2020-07/2021	Quantification of Osteosarcoma Mineralization on Plain Radiographs	Co-I	Dartmouth-Hitchcock Foundation	\$30,000
08/2019-07/2020	Feasibility of Vertebral Body Spring Intensity Modulated	Co-I	Winship Invest Pilot Grant	\$50,000

	Proton Therapy Craniospinal Irradiation with in Vivo Range Verification in Growing Children			
05/2019-04/2020	Cherenkov Imaging of Total Skin Electron Irradiation - determination of applicability and technique development	PI	Winship Invest Pilot Grant	\$15,000

IX. PROGRAM DEVELOPMENT:

A. Clinical program

<u>DATE</u>	<u>ACTIVITY</u>	<u>ROLE</u>
2019-present	ViewRay MR-Linac adaptive therapy	Lead Physicist
2019-2021	ViewRay MR-Linac adaptive therapy IROC/NRG credentialing (first in US)	Lead Physicist
2018-2019	Emory Proton Therapy Center (EPTC) imaging ACR credentialing	Lead Physicist
2018-2019	EPTC Imaging device commissioning (MR/CT/ultrasound)	Lead Physicist
2018-2019	EPTC x-ray devices state registration	Lead Physicist
2018-2019	EPTC IROC/NRG credentialing	Physicist
2017-2018	Brigham Women's Hospital Co-60 Total Body Irradiation	Resident
2016-2017	Massachusetts General Hospital TrueBeam commissioning	Resident

B. Academic program

<u>DATE</u>	<u>ACTIVITY</u>	<u>ROLE</u>
2021-2022	Pacific Northwest National Laboratory Contract - Evaluate possible differences in radiobiological response of cells at different ionization radiation energies (662 KeV gamma photons, 320 kVp photons, 9 MeV electrons)	Lead Physicist
2020-2021	Commissioning of XRad320 (Precision X-Ray) preclinical irradiator	Lead Physicist
2019-present	Electron FLASH RT in clinical setting (first in world)	Lead Physicist
2019-present	Norris Cotton Cancer Center (NCCC) Core Radiation Shared Resource	Physicist
2019-present	NCCC TEC program	Member
2011-present	Cherenkov imaging in RT (first in world)	Pioneer Student/Investigator
2018-2019	EPTC Proton FLASH	Lead Physicist

C. Clinical Trials, Translational IRB/IACUC protocol

<u>DATE</u>	<u>PROTOCOL</u>	<u>TYPE (SITE)</u>	<u>ROLE</u>
2022-present	A Phase I/II Trial of Electron FLASH Radiotherapy for Treatment of de-novo Cutaneous Lymphomas.	Clinical Trials (Dartmouth)	Scientific PI/Sponsor of FDA IDE

2021-present	Rational design of multi-agent molecular fluorescence guided surgery to improve visualization of soft-tissue sarcomas	IACUC (Dartmouth)	Co-I
2020-present	Phase III IGRT and SBRT versus IGRT and Hypofractionated IMRT for Localized Intermediate Risk Prostate Cancer (NRG GU-005)	Clinical Trials (Dartmouth)	Physicist
2020-present	Stereotactic MRI-guided On-table Adaptive Radiation Therapy (SMART) for Locally Advanced Pancreatic Cancer	Clinical Trials (Dartmouth)	Physicist
2020-present	Flash Radiation for Reduced Normal Tissue Damage	IACUC (Dartmouth)	Co-PI
2019-present	Retrospective analysis of image volumes and associated treatment plan data for development of artificial intelligence models to support radiation therapy	IRB (Dartmouth)	PI
2019-present	CELSI Imaging	IACUC (Dartmouth)	Co-I
2019-2020	Cherenkov Imaging of Total Skin Electron Irradiation - determination of applicability and technique development	IRB (Emory)	PI
2014-2016	Cherenkov Imaging in Radiation Therapy- determination of broad applicability and technique development	IRB (Dartmouth)	Co-I

X. RESEARCH ACTIVITIES

<u>DATE</u>	<u>TOPICS</u>
2020-present	Gated Cardiac Radioablation Through Multi-Task Machine Learning and Real-Time MR Imaging for Enhanced Myocardium Sparing
2019-present	AI powered Radiation Therapy
2019-present	Electron Flash Radiation Therapy
2019-present	Visual Isocenter Position Enhanced Review (VIPER): a Cherenkov imaging-based solution for MR-linac daily QA
2011-present	Radio-luminescence imaging-based dosimetry and chemical sensing in RT
2015-present	Single Imager based Proton Radiography and CT
2018-present	Ultra-fast Optical Imaging for Quality Assurance and Optimization of Proton FLASH Radiation Therapy
2018-present	A Single-imager based Electronic Portal Imaging System for Transmission Proton FLASH Radiation Therapy Verification
2018-2019	Proton FLASH RT Platform Based on the Varian ProBeam System
2018-2019	Metal-intercalated carbon dots as radiosensitizers for non-small cell lung cancer therapy
2018-2019	Cherenkov Imaging of Total Skin Electron Irradiation - determination of applicability and technique development
2017-2018	Log-based Quality Assurance for Proton PBS delivery
2016-2017	Real Tissue Water Equivalent Path Lengths Using an Efficient Dose Extinction Method

2015-2018	Iterative Optimization of Relative Stopping Power by Single Detector Based Multi-Projection Proton Radiography
2015-2018	Assessing The Need for Weekly Portal Imaging for Breast Patients
2008-2010	Nitrogen Doped Defect Center in Diamond: Investigate the appellations of nitrogen doped defect center in diamond for quantum computing
2008-2010	Nitrogen Doped Defect Center in Diamond: Building a confocal microscopy system
2008-2010	Colorful Laser Schlieren method: Analyzed the distribution of various fields (temperature field, airflow field) by using the Laser-schlieren technique; and manifested it in color image.

XI. CLINICAL ACTIVITIES

<u>DATE</u>	<u>TOPICS</u>	<u>SYSTEM/DEVICE</u>
2019	MR-Linac acceptance and commissioning	ViewRay MRIdian/Water tank/Ion chamber/Electrometer/CIRS motion phantom/ACR MR phantom/Sun Nuclear IC-Profiler
2019	MR-Linac treatment planning system acceptance and commissioning	ViewRay MRIdian
2019	MR-guided adaptive radiation therapy clinical workflow	Aria/ViewRay MRIdian
2019-present	MR-guided adaptive radiation therapy patient specific QA	ArcCheck/ViewRay MRIdian
2019-present	IMRT patient specific QA	ArcCheck/EPID/Varian Eclipse
2019-present	MR-Linac QA (Daily/Monthly/Yearly)	ViewRay MRIdian/Water tank/Ion chamber/Electrometer/CIRS motion phantom/ACR MR phantom/Sun Nuclear IC-Profiler/ViewRay phantom/DoseOptics Camera/VIPER system
2019-present	Treatment device maintenance and QA	ViewRay MRIdian/Varian TrueBeam/Trilogy/C-series linac
2018	EPTC imaging system commissioning	Siemens Aera 1.5T MRI scanner/ Siemens Somatom Definition Edge Dual-energy CT scanner/ Hitachi ultrasound system
2018	Commissioning of peripheral systems for CT/MR/ultrasound simulators	Varian RGSC/SDX respiratory monitoring system/Prostate LDR templates and step motor system
2018	Proton therapy system acceptance and commissioning	Varian ProBeam/IBA Lynx/IBA Stingray/IBA DigiPhan/IBA blue phantom/IBA Matrixx/ IBA Zebra/Logos XRV
2018	Proton therapy system QA (Daily/Monthly/Yearly)	Varian ProBeam/IBA Lynx/IBA Stingray/IBA DigiPhan/IBA blue phantom/IBA Matrixx/IBA Zebra/DailyQA3/Logos XRV

2018	Proton therapy treatment planning system acceptance and commissioning	Raystation TPS/Varian Eclipse
2018	Proton therapy clinical workflow	Raystation TPS/Varian Eclipse/Aria
2018-2019	Proton therapy patient specific QA	Raystation TPS/IBA DigiPhan
2018	Shielding design and radiation safety survey	Varian ProBeam/Survey meter/Neutron meter/Neutron bubble detector
2015-2018	Treatment planning	Mosaiq/Aria/Raystation/XiO and Astroid (proton therapy)/Oncentra (HDR)
2015-2018	Therapy system QA (Monthly/Yearly)	Elekta and Varian linacs
2015-2018	Patient specific QA	IBA Matrixx/Delta4
2015-2018	Brachytherapy (HDR/LDR)	Oncentra and VariSeed

XII. ENTREPRENEURIAL ACTIVITIES

A. Activities

<u>DATE</u>	<u>COMPANY</u>	<u>ROLE</u>
2020-present	ViewRay	Roadmap meeting
2019-present	MathWorks	Customer advisor board member
2019	Siemens Healthineers	Roadmap meeting for CT simulator
2015-present	DoseOptics, inc.	Consultant

B. Patents

1. ZHANG R, POGUE BW, GLASER AK, GLADSTONE DJ, JARVIS LA, ANDREOZZI JM, et al. Cherenkov imaging systems and methods for determining radiation dose. Publication number WO2016176265 A1. Google Patents; 2016.
2. Pogue BW, Gladstone DJ, Davis SC, Axelson JJ, Glaser AK, Zhang R. Method And System For Using Cherenkov Radiation To Monitor Beam Profiles And Radiation Therapy. Publication number US20140114150 A1; WO2012159043A2; WO 2012159043 A3. Google Patents; 2014.
3. Daniel A. Alexander, Petr Bruza, Rongxiao Zhang, David J. Gladstone, MR-Linac Compatible Daily Quality Assurance System and Methods Utilizing Cherenkov Imaging for Imaging-Radiation Isocenter Coincidence Measurement, in submission
4. Petr Bruza, Brian Pogue, M, Ramish Ashraf, David Gladstone, Rongxiao Zhang, Systems and methods for accurate FLASH therapy, in submission

XIII. MEMBERSHIPS, OFFICE, JOURNAL, COMMITTEE ASSIGNMENTS IN ACADEMIC AND PROFESSIONAL SOCIETIES:

<u>DATE</u>	<u>SOCIETY/COMMITTEE/JOURNAL</u>	<u>ROLE</u>
2020-present	UHDpulse	Member
2021-present	RSNA	Member
2021-present	ASTRO	Member
2021	DOD LCRP Detection, Diagnosis and Prognosis (DDP) Panel	Reviewer
2021-present	ABR volunteer program	Volunteer
2021-present	American Association of Physicists in Medicine (AAPM) Fluorescence-Guided Intervention Workgroup (WGFGI)	Chair

2021-present	NRG Medical Physic FLASH RT committee	Member
2020-present	AAPM Annual Meeting	Reviewer
2020-2021	AAPM Summer Undergraduate Fellowship/DREAM program	Mentor
2019-present	Particle Therapy Co-Operative Group (PTCOG) Imaging Subcommittee	Member
2020-present	AAPM Task Group No. 311: Guidance for Technical Performance Evaluation for Fluorescence Guided Surgery Systems	Lead reviewer
2019-present	AAPM Treatment Delivery Sub-Committee	Member
2018	DOD LCRP Detection, Diagnosis and Prognosis (DDP) Panel	Reviewer
2019	AAPM Task Group No. 274: Respiratory Motion Management for Particle Therapy	Reviewer
2019-2020	Health Occupations Students of America	Judge
2019-2020	AAPM Professional Mentorship Working Group	Guest
2018-2019	EPTC Radiation Safety Committee	Co-Chair
2018-2019	United Kingdom Medical Research Council	Reviewer
2018-present	Editorial Board of PLOS ONE	Academic Editor
2017-2019	AAPM Treatment Delivery Sub-Committee	Guest
2017-2019	The IJROBP Resident Peer Reviewer Training (RePRT) Program	Trainee
2016-present	AAPM New England Chapter	Member
2014-present	American Association of Physicists in Medicine (AAPM)	Member
2014-2016	The Optical Society of American (OSA)	Member
2014-2016	World Molecular Imaging Society (WMIS)	Member
2014	University of Birmingham and Queen Elizabeth Hospital Birmingham	Visit scholar
2014	SLAC Geant4 Tutorial 2014	Trainee
2012-present	IJROBP, Medical Physics, Physics in Medicine and Biology, Radiation Oncology, Physica Medica, Nucl. Instrum. Methods. Phys. Res, Journal of Biomedical Optics, Optics Express, Biomedical Optics Express, JACMP, Scientific Reports, Optics Letters, Journal of Radiation Research, CA: A Cancer Journal for Clinicians	Reviewer
2010-2015	Dartmouth Graduate Student Fellowship	Member

XIV. AWARDS, HONORS, MEDIA HIGHLIGHTS:

<u>DATE</u>	<u>AWARD/HONOR/MEDIA HIGHLIGHTS</u>	<u>ROLE</u>
2021	NCCC research retreat poster contest – best poster	Senior author
2021	Zietman A. Red Journal Issue Highlights July 1, 2021 https://www.redjournal.org/issue/S0360-3016(20)X0017-4	Investigator
2021	AAPM John R. Cameron Young Investigator Competition	Senior author
2021	AAPM Scientific Council Program	Co-author
2021	Converted clinical linac delivers FLASH radiotherapy (IOP physicsworld)	Investigator
2021	Dartmouth Researchers Pilot Safer Method of Radiation Cancer Therapy (Dartmouth news)	Investigator
2020	Piloting a FLASH Radiotherapy Beam Development for Treatment of Cancer (NCCC news)	Investigator

2020	Researchers capture first images of oxygen in cancer tumors during radiation therapy (Thayer news)	Investigator
2019	Optical imaging provides quality assurance for small radiotherapy beams (IOP physicsworld)	Investigator
2018	Maps of in vivo oxygen pressure with submillimetre resolution and nanomolar sensitivity (Nature Biomedical Engineering news)	Investigator
2017	AAPM Science Council Associates Mentorship Program	Awardee
2017	IJROBP Resident Peer Reviewer Training (RePRT) Program	Awardee
2017	Travel award from Centers of Expertise in Healthcare Quality and Patient Safety, Harvard Medical School	Awardee
2016	AAPM Scientific Council Program	Awardee
2016	AAPM John R. Cameron Young Investigator Competition	Co-author
2015	Cover of Optics & Photonics News on <i>in vivo</i> CELSI	Investigator
2015	Optics in the Molecular Imaging Race (Optics & Photonics News)	Investigator
2015	Dartmouth Graduation Award for Academic Excellence	Awardee
2015	Travel Stipends, World Molecular Imaging Congress	Awardee
2015	Cherenkov Effect Improves Radiation Therapy for Patients with Cancer (NCCC news)	Investigator
2015	Cerenkoscropy monitors breast treatments (IOP physicsworld)	Investigator
2015	Cerenkov light tracks radiation dose (IOP physicsworld)	Investigator
2015	Cerenkoscropy tested on human patient (IOP physicsworld)	Investigator
2015	Cerenkov imaging tracks CyberKnife therapy (IOP physicsworld)	Investigator
2015	Cherenkov Emissions Provide Real-Time Tool for Quality Assurance in Radiation Therapy (IOP physicsworld)	Investigator
2014	AAPM John R. Cameron Young Investigator Competition	Awardee
2014	Best Presentation, New England AAPM Young Investigators' Symposium	Awardee
2014	A scientific first: Team engineers photography radiation beams in human body through Cherenkov effect (Facebook Science X)	Investigator
2014	Imaging scheme tracks tumour oxygenation (IOP physicsworld)	Investigator
2014	Physicists, physicians, engineers photograph radiation beams through the Cherenkov effect (NCCC news)	Investigator
2013	Cerenkov technique eyes linac QA (IOP physicsworld)	Investigator
2013	AAPM Best in Physics Imaging Award	Awardee
2013	Cherenkov Emission Imaging and Spectroscopy Utilizing Isotopes and a Linear Accelerator (Princeton Instrument)	Investigator
2012	Tracking oxygenation during radiotherapy (IOP physicsworld)	Investigator
2010-2015	Dartmouth graduate student scholarship	Awardee
2009	Third Prize for college physics research experiments	Awardee
2008-2010	USTC undergraduate silver scholarship	Awardee
2006	Gold prize national biology contest for high school students	Awardee
2005	Silver prize national chemistry contest for high school students	Awardee
2003	Gold prize national physics contest for middle school students	Awardee
2003	Silver prize provincial math contest for middle school students	Awardee

XV. INVITED PRESENTATIONS:

DATE	TOPIC/TITLE	ORGANIZATION	LOCATION
2022	Translation FLASH-RT at Dartmouth	Brigham and Women's Hospital	Boston, MA
2022	Electron FLASH-RT for Skin	Water's Edge Dermatology	Jupiter, FL
2021	Radiation Oncology & BME; Partners in Research at Dartmouth	Dartmouth Biomedical & Biotechnical Engineering Symposium	Hanover, NH
2021	Existing and missing Pillars of D-H RadOnc research: physics, biology and engineering	Dartmouth RadOnc Research Retreat	Lebanon, NH
2021	Veterinary FLASH and Radiation Oncology Research	Radiation Research Society 2021 Annual Meeting	Pseudo Puerto Rico
2021	Ultra-high Dose Rate FLASH-RT at Dartmouth	NCCC grand rounds	Lebanon, NH
2021	FLASH Radiation Therapy at Dartmouth	NCCC TEC	Lebanon, NH
2021	Translational Ultra-High Dose Rate Radiotherapy (FLASH-RT)	Dartmouth-Hitchcock Medicine Grand Rounds	Lebanon, NH
2021	Electron FLASH Radiation Therapy: from feasibility to clinical translation	UT Southwestern Medical Center	Dallas, TX
2021	Cherenkov & Luminescence Imaging in Radiation Therapy	Harvard Medical School	Boston, MA
2021	AI-Powered MR-guided Adaptive Radiation Therapy	Dartmouth-Hitchcock Medical Center	Lebanon, NH
2021	Radioluminescence Imaging based dosimetry and chemical sensing for FLASH RT	Nanjing University of Aeronautics and Astronautics	Nanjing, China
2020	ViewRay Global User Meeting	ViewRay	Zoom
2020	Radioluminescence Imaging for FLASH RT Dosimetry and Oximetry	Georgia Tech	Atlanta, GA
2019	FLASH-RT technologies	NCCC TEC	Lebanon, NH
2019	A Physicist's Perspective on Building a Proton Center from The Ground Up	Johns Hopkins University	Baltimore, MD
2018	Is Weekly Portal Imaging Necessary for Breast EBRT with Surface Imaging Guidance?	VisionRT	Buckhead, GA
2018	Exploring Applications of Cherenkov Imaging in Radiation Therapy	Emory University	Atlanta, GA
2014	Human Cherenkovscopy in Radiation Therapy	Dartmouth-Hitchcock Medical Center	Lebanon, NH

XVI. BIBLIOGRAPHY

(<https://scholar.google.com/citations?user=Lsw7Di8AAAAJ&hl=en>):

A. Original articles:

1. Mahbubur Rahman, Jakub Kozelka, Austin Sloop, M. Ramish Ashraf, Petr Bruza, David J. Gladstone, Brian W. Pogue, Jeff Kapatoes, Bill Simon, Rongxiao Zhang, Characterization of Newly Designed EDGE Detector for UHDR FLASH Radiotherapy, 2022, in review
2. Savannah M. Decker, Daniel A. Alexander, Petr Bruza, Rongxiao Zhang, Erli Chen, Lesley A. Jarvis, David J. Gladstone, Brian W. Pogue, Performance Comparison of Quantitative Metrics for Analysis of in vivo Cherenkov Imaging During Radiotherapy, 2021, in review
3. R. Hachadorian, P. Bruza, M. Jermyn, D. J. Gladstone, R. Zhang, L. A. Jarvis, B. W. Pogue, Remote Dose Imaging from Cherenkov Images using Spatially-Resolved CT Calibration in Whole Breast Radiotherapy, 2021, in review
4. Daniel A. Alexander, Michael Jermyn, Petr Bruza, Rongxiao Zhang, Erli Chen, Savannah M. Decker, Tatum L. McGlynn, Rory A. Rosselot, Jae Lee, Melanie L. Rose, Benjamin B. Williams, Brian W. Pogue, David J. Gladstone, Lesley A. Jarvis, Retrospective Evaluation of an Always-on Cherenkov Imaging System for Radiotherapy Quality Improvement, 2021, in review
5. Issam El Naqa, Brian W. Pogue, Rongxiao Zhang, Ibrahim Oraiqat, Katia Parodi, Image guidance for Flash Radiotherapy, MedPhys, 2021, in review
6. Harold M. Swartz, P. Jack Hoopes, David J. Gladstone, Valentin Demidov, Peter Vaupel, Ann Barry Flood, Benjamin B. Williams, Rongxiao Zhang, Brian W. Pogue, A radiation biological analysis of the oxygen effect as a possible mechanism in FLASH, ISOT[†], 2021, in review
7. Kayla EA Duval, Salome Shubitidze, Mahbubur Rahman, M. Ramish Ashraf, Rongxiao Zhang, David J. Gladstone, Brian W. Pogue, P. Jack Hoopes, FLASH Radiotherapy delays the onset of normal tissue damage in skin without compromising treatment efficacy, 2021, in review
8. M. Ramish Ashraf, Mahbubur Rahman, Xu Cao, Kayla Duval, P. Jack Hoopes, David J. Gladstone, Brian W. Pogue, Rongxiao Zhang, Petr Bruza, Individual Pulse Monitoring and Dose Feedback System for Pre-Clinical Implementation of FLASH-RT, Physics in Medicine and Biology, 2021, in review
9. Mahbubur Rahman, Petr Bruza, David J. Gladstone Rongxiao Zhang and Brian W. Pogue, (2022). "Utilizing Pencil Beam Scan Dynamics and a Scintillation Screen to produce 3D Dose Distribution of Proton Beams." Journal of Physics: Conference Series 2167(1): 012034.
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11. Mahbubur Rahman, M. Ramish Ashraf, David J. Gladstone, Petr Bruza, Xu Cao, P. Jack Hoopes, Brian W. Pogue, Rongxiao Zhang, Rahman, M., et al. (2021). "Treatment Planning System for Electron FLASH Radiation Therapy: Open-Source for Clinical Implementation." Int J Radiat Oncol Biol Phys.
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B. Book chapters:

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C. Abstracts:

1. Austin Sloop, Mahbubur Rahman, Jakub Kozelka, Muhammad Ramish Ashraf, Petr Bruza, David Gladstone, Brian Pogue, Jeffrey Kapatoes, William Simon, Rongxiao Zhang, Characterization of Newly Designed EDGE Detector for UHDR FLASH Radiotherapy, AAPM Spring Clinical Meeting 2022, New Orleans, LA [**Talk, Early-Career Investigator Symposium**]
2. Mahbubur Rahman, Kevin Erhart, David Gladstone, Petr Bruza, Lesley Jarvis, Brian Pogue, Jack Hoopes, Rongxiao Zhang, Intensity Modulation in Electron UHDR FLASH Radiotherapy, AAPM Spring Clinical Meeting 2022, New Orleans, LA [**Poster, Best Poster Contest**]
3. Savannah Decker, Daniel Alexander, Petr Bruza, Rongxiao Zhang, Erli Chen, Lesley Jarvis, David Gladstone, Brian Pogue, Automated Detection Algorithms for Improving Radiotherapy Delivery that Directly Quantify Treatment Errors from Online In Vivo Cherenkov Imaging, AAPM Spring Clinical Meeting 2022, New Orleans, LA [**Talk, Early-Career Investigator Symposium**]
4. Daniel Alexander, Michael Jermyn, Petr Bruza, Rongxiao Zhang, Erli Chen, Savannah Decker, Brian Pogue, Lesley Jarvis, David Gladstone, Clinic-Wide Cherenkov Imaging Identifies New Areas of Quality Improvement in Radiation Therapy, AAPM Spring Clinical Meeting 2022, New Orleans, LA [**Talk, Early-Career Investigator Symposium**]
5. Mahbubur Rahman, Muhammad Ramish Ashraf, Rongxiao Zhang, Xu Cao, David Gladstone, Lesley Jarvis, Jack Hoopes, Brian Pogue, Petr Bruza, In Vivo Cherenkov Imaging Monitors FLASH RT, AAPM Spring Clinical Meeting 2022, New Orleans, LA [**Poster, Best Poster Contest**]
6. Harold M. Swartz, Valentin Demidov, P. Jack Hoopes, David J. Gladstone, Peter Vaupel, Ann Barry Flood, Benjamin B. Williams, Rongxiao Zhang, Brian W. Pogue, A radiation biological analysis of the possible mechanism for the oxygen effect in FLASH, FRPT, 2021 [ePoster]
7. Mahbubur Ronny Rahman, Petr Bruza, David J. Gladstone, Kayla Duval, Valentin Demidov, Lesley A. Jarvis, Philip E. Schaner, Xu Cao, M. Ramish Ashraf, Brian W. Pogue, P. Jack Hoopes, Rongxiao Zhang, Dartmouth Program for FLASH Radiotherapy, NCCC research retreat, 2021 [**First Place in Poster Contest**]
8. Savannah Decker, Petr Bruza, Rongxiao Zhang, David J. Gladstone, Brian Pogue, Lesley A. Jarvis, Quantitating Radiation Dose with Cherenkov Imaging, NCCC research retreat, 2021 [Poster]
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10. Brady Hunt, Gregory A. Russo, Bassem I. Zaki, Zhong Han, Gobind Gill, David Gladstone, Brian W. Pogue, Rongxiao Zhang, Deep learning-based deformable registration of MR cine sequences for automated and patient-specific target tracking on MR-Linacs, CMIMI, 2021 [**Talk**]
11. Rongxiao Zhang, Petr Bruza, Kayla Duval, Xu Cao, Ramish Ashraf, Mahbubur Rahman, Gobind Gill, Alan Hartford, Bassem Zaki, Philip E. Schaner, Lesley Jarvis, P. Jack Hoopes, Brian W. Pogue and David Gladstone, Logistics of A Flash-Rt Program in Clinical Setting, FRPT, 2021 [ePoster]

12. M. Ramish Ashraf, Mahbubur Rahman, [Rongxiao Zhang](#), Xu Cao, Benjamin B. Williams, P. Jack Hoopes, David J. Gladstone, Brian W. Pogue, Petr Bruza, Pulse-Resolved, Beam Monitoring and Feedback System for FLASH-RT Using Fiber-Coupled Scintillating Detectors, FRPT, 2021 [**Talk, Best Abstract Award**]
13. Mahbubur Rahman, M. Ramish Ashraf, David J. Gladstone, Petr Bruza, Lesley A. Jarvis, Philip E. Schaner, Xu Cao, Brian W. Pogue, P. Jack Hoopes, [Rongxiao Zhang](#), LINAC Modifications, Commissioning and Treatment Planning with Minimal Alteration of Clinical Workflow, FRPT, 2021 [**Talk**]
14. V. Demidov, X. Cao, R. Ashraf, M. Rahman, [R. Zhang](#), D. J. Gladstone, P. J. Hoopes, J. T. Elliott, B. W. Pogue, Longitudinal In-Vivo Assessment of Mouse Skin Damage with Functional Optical Coherence Tomography in Flash Versus Conventional Radiotherapy, FRPT, 2021 [**Talk, Best Abstract Award**]
15. Xu Cao, [Rongxiao Zhang](#), Tatiana V. Esipova, Srinivasa Rao Allu, Ramish Ashraf, Mahbubur Rahman, Jason R. Gunn, Petr Bruza, David J. Gladstone, Benjamin B. Williams, Harold M. Swartz, P. Jack Hoopes, Sergei A. Vinogradov, and Brian W. Pogue, A Computational Model Of In Vivo Oxygen Depletion During Electron Flash Irradiation, FRPT, 2021 [ePoster]
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18. Mahbubur Rahman, Muhammad Ramish Ashraf, [Rongxiao Zhang](#), David Gladstone, Xu Cao, Benjamin Williams, Jack Hoopes, Brian Pogue, Petr Bruza, Spatiotemporal Dose Characterization of An Electron FLASH Beam from a LINAC Using Radioluminescence and Cherenkov Imaging, AAPM Annual Meeting, 2021. [**Talk, Science Council Session**]
19. Mahbubur Rahman, Muhammad Ramish Ashraf, David Gladstone, Petr Bruza, Lesley Jarvis, Philip Schaner, Xu Cao, Brian Pogue, Jack Hoopes, [Rongxiao Zhang](#), Electron FLASH in Clinical Setting: LINAC Conversion, Commissioning and Treatment Planning, AAPM Annual Meeting, 2021. [**Talk, Young Investigator Symposium**]
20. Rachael Hachadorian, Daniel Alexander, Erli Chen, David Gladstone, Michael Jermyn, Gobind Gill, [Rongxiao Zhang](#), Petr Bruza, Lesley Jarvis, Brian Pogue, Comparing Patient Setup Techniques Between Optical Surface Guidance and Conventional Tattoo/Laser Alignment Using Cherenkov Image Consistency Metrics, AAPM Annual Meeting, 2021.
21. Rachael Hachadorian, David Gladstone, Michael Jermyn, Petr Bruza, [Rongxiao Zhang](#), Lesley Jarvis, Brian Pogue, Using the Planning CT Scan for Pixel-To-Pixel Corrections of Cherenkov Intensity for Dose Imaging, AAPM Annual Meeting, 2021.
22. Savannah Decker, Daniel Alexander, Rachael Hachadorian, [Rongxiao Zhang](#), David Gladstone, Petr Bruza, Brian Pogue, Theoretical Derivation and Experimental Verification of Beam and Tissue Factors Affecting the Reemitted Cherenkov Signal During External Beam Irradiation, AAPM Annual Meeting, 2021.
23. Daniel Alexander, [Rongxiao Zhang](#), Petr Bruza, Aris Rassias, Jacqueline Andreozzi, Brian Pogue, David Gladstone, 3D Isocenter Coincidence Measurement for MR-Linacs with Cherenkov Imaging, AAPM Annual Meeting, 2021.

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25. Muhammad Ramish Ashraf, Mahbubur Rahman, [Rongxiao Zhang](#), Benjamin Williams, Jack Hoopes, David Gladstone, Brian Pogue, Petr Bruza, Pulse Resolved Beam Characterization and Feedback for FLASH-RT Using Radioluminescent Dosimeters, AAPM Annual Meeting, 2021.
26. Brady Hunt, Zhong Han, Bassem Zaki, Gregory Russo, Brian Pogue, David Gladstone, [Rongxiao Zhang](#), Gantry Motion Artifact Reduction Using Deep Learning: Towards Volumetric Modulated Arc Therapy On MR-Linacs, AAPM Spring Clinical Meeting, 2021. [**Talk, Early-Career Investigator Symposium**]
27. Mahbubur Rahman, Muhammad Ramish Ashraf, David Gladstone, Petr Bruza, Xu Cao, Brian Pogue, Jack Hoopes, [Rongxiao Zhang](#), Clinical Treatment Planning System for Electron FLASH Radiotherapy, AAPM Spring Clinical Meeting, 2021. [**Talk, Early-Career Investigator Symposium**]
28. Daniel Alexander, Petr Bruza, Jacqueline Andreozzi, Brian Pogue, [Rongxiao Zhang](#), David Gladstone, MRI in Radiation Therapy: MRI/Linear accelerator combined Quality Assurance, AAPM Spring Clinical Meeting, 2021. [**Talk, Early-Career Investigator Symposium**]
29. Zhong Han, Brady Hunt, Rachael Hachadorian, Petr Bruza, Brian Pogue, [Rongxiao Zhang](#), Deep Semantic Segmentation of Veins as Biological Fiducials in Cherenkov Images of Breast Radiotherapy, AAPM Spring Clinical Meeting, 2021. [ePoster]
30. Mahbubur Rahman, Petr Bruza, Rachael Hachadorian, Daniel Alexander, Xu Cao, [Rongxiao Zhang](#), David J. Gladstone, Brian W. Pogue, Cherenkov Image Optimization in Radiotherapy through Spectral Filtering of Room Light and Camera, NEAAPM Winter Meeting, 2021. [**Talk, Peter Neurath Young Investigator Symposium**]
31. [Rongxiao Zhang](#), Mahbubur Rahman, Ramish Ashraf, Nathan C. Nelson, Brian W. Pogue, Petr Bruza, David J. Gladstone, Commissioning of the First Treatment Planning System for Electron Flash Radiation Therapy in a Clinical Setting, Radiation Research Society Annual Meeting 2020. [ePoster]
32. Mahbubur Rahman, Muhammad R. Ashraf, [Rongxiao Zhang](#), Petr Bruza, Chad A. Dexter, Lawrence Thompson, Xu Cao, Brian W. Pogue, David J. Gladstone, Electron FLASH Delivery at Treatment Room Isocenter for Reversible Conversion of a Clinical Linear Accelerator, Radiation Research Society Annual Meeting 2020. [ePoster]
33. Petr Bruza, [Rongxiao Zhang](#), Chad A. Dexter, Lawrence Thompson, Xu Cao, Mahbubur Rahman, Muhammad R. Ashraf, David J. Gladstone, Brian W. Pogue, Implementing Real-time Optical Imaging Sensors in FLASH Radiotherapy, Radiation Research Society Annual Meeting 2020. [ePoster]
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35. Mahbubur Rahman, Muhammad R. Ashraf, Petr Bruza, [Rongxiao Zhang](#), David J. Gladstone and Brian W. Pogue, Radioluminescence and Cherenkov Imaging for Electron FLASH dosimetry, Radiation Research Society Annual Meeting 2020. [ePoster]
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XVII. PERSONAL STATEMENT

I completed my PhD in physics from Dartmouth, focused around imaging the first veterinary and human images of Cherenkov in external beam radiation therapy and going on to show how to achieve chemical sensing. From this, I was admitted to the Harvard Medical Physics Residency Program 2015-2018, where I received training in all aspects of radiation therapy, including proton therapy. In 2018, I was recruited to the Department of Radiation Oncology, Emory University School of Medicine as a proton therapy medical physicist, where I joined the acceptance of the proton center, lead on the commissioning of an individual gantry treatment room and the commissioning of all the imaging modalities. I was recruited to be a faculty clinical physicist II at Dartmouth Medical School and Dartmouth-Hitchcock Health in 2019 to focus on the MRI-guided radiation therapy and medical physics residency program.

My research interests reside in innovative imaging guidance, molecular imaging, radiation transport modeling, novel treatment planning, dose delivery technologies and adaptive radiation therapy. Currently, I conduct research on optical based dose measurement and quality assurance, beam modeling with Monte Carlo methods, machine learning for medical image processing and translational studies on FLASH therapy and photon dynamic protected radiation therapy. Our work has been presented in >100 national/international conference abstracts, published in >70 peer-reviewed journal papers, led to institutionally and federal funded projects as well as SBIR grant funded and commercialized products.

Educational-wise, I am faculty of the Dartmouth PhD Program in Medical Physics and medical physics residency program at Emory. As of now, I have recruited > 10 students and served as their mentors for projects and thesis studies. I have been teaching lectures for the core curriculums including medical imaging, proton/particle therapy, radiation transport and practicum. Professionally, I serve as member, co-chair and chair on multiple committees and workgroups of AAPM, ASTRO and NRG. I have participated/led the reviewing of multiple AAPM task group

reports and co-authored NRG whitepaper such as the one on medical physics guidelines for FLASH-RT.

In the long term, I am committed to be a medical physicist and faculty who leads on clinical, translational research as well as teaching and eventually implement scientific discovery in clinical practice to ensure and continuously improve the quality of radiation therapy.