Curriculum Vitae

T. Douglas Mast

Professor of Biomedical Engineering, University of Cincinnati
Department of Biomedical Engineering, College of Engineering and Applied Science
and Department of Internal Medicine, Division of Cardiovascular Health and Disease, College of Medicine
3938 Cardiovascular Research Center, Cincinnati OH 45267-0586
(513) 558-5609 (tel.), (513) 558-6102 (fax), doug.mast@uc.edu

Education

PhD (Acoustics)	1993	The Pennsylvania State University, University Park, Pennsylvania Dissertation: *Physical Theory of Narrow-Band Sounds Associated with Aneurysms*
Certificate (Music)	1988	The Naropa Institute, Boulder, Colorado
B.A. (Physics/Mathematics)	1987	Goshen College, Goshen, Indiana

Employment

2004–	University of Cincinnati	Professor of Biomedical Engineering, 2016– Research Associate Professor (Secondary) of Internal Medicine, 2015– Program Chair of Biomedical Engineering, 2012–2017 Associate Professor of Biomedical Engineering, 2010–2016 Assistant Professor of Biomedical Engineering, 2004–2010
2002–2004	Ethicon Endo-Surgery	Staff Biomedical Engineer
2001–2002	Ethicon Endo-Surgery	Senior Biomedical Engineer
1999–2001	The Pennsylvania State University	Assistant Professor of Acoustics
1997–2001	Applied Research Laboratory, Penn State	Research Associate
1996–1997	Applied Research Laboratory, Penn State	Postdoctoral Scholar
1993–1996	University of Rochester	Postdoctoral Fellow

Honors and Awards

Distinguished Engineering Research Award, College of Engineering and Applied Science, University of Cincinnati	2014
Article of the Month, Journal of Therapeutic Ultrasound	September 2014
Elected member of Sigma Xi, the Scientific Research Society	2013–
Who's Who in Science and Engineering (Marquis)	1996–1997, 2010–
Who's Who in America (Marquis)	2009
Who's Who in Engineering Academia (Academic Keys)	2005–
Kenneth E. Simowitz Memorial Award, The Pennsylvania State University	1996
F. V. Hunt Fellowship, Acoustical Society of America	1994–1995
Turner Laboratory Fellowship, Goshen College	1986

Courses Taught

BME 4010C *Research Design II* Level: UG 3.0 credit hrs

In this course, students develop their proposal for their senior-year BME Research Design Capstone project. Students identify their Capstone mentor, work with their mentor to identify a research project, conduct a literature search and review the literature to familiarize themselves with the research question, work in the mentor's lab to learn the necessary techniques to accomplish the research, and write, present, and defend a Research Design Capstone proposal.

BME 6012/5112 *Biomedical Signal and Image Processing* Level: U,G 3.0 credit hrs

Fundamentals of signal and image processing, Fourier analysis, and stochastic processes, with emphasis on biomedical applications. Filtering, transformation and feature extraction for biomedical signals and images.

BME 6010/5110 *Biomedical Ultrasound* Level: U,G 3.0 credit hrs

[co-taught with Profs. Christy Holland and Kevin Haworth]

Physics, instrumentation, and applications of diagnostic and therapeutic ultrasound. Topics include principles of ultrasound generation, propagation, and scattering, ultrasound transducers and beamforming, B-scan imaging, Doppler and hemodynamics, exposimetry, cavitation, drug delivery, hyperthermia, and clinical applications.

BME 7005 *Biomedical Engineering Seminar* Level: G 1.0 credit hrs

Presentations and discussion of recent developments and research work in Biomedical Engineering and Science.

BME 7001 *Biomedical Engineering Survey* Level: G 3.0 credit hrs

Survey of biomedical engineering research topics.

BME 490 *Research Design II* Level: U 3.0 credit hrs

Students develop their proposal for their senior-year BME Research Design Capstone. Students identify their Capstone mentor, work with their mentor to identify a research project, conduct a literature search and review the literature to familiarize themselves with the research question, work in the mentors lab to learn the necessary techniques to accomplish the research, and write, present, and defend a Research Design Capstone proposal.

BME 612 *Medical Signal and Image Processing* Level: U, G 3.0 credit hrs

Fundamentals of signal and image processing, Fourier analysis, and stochastic processes, with emphasis on biomedical applications. Filtering, transformation and feature extraction for biomedical signals and images.

BME 705 *Biomedical Engineering Research Design* Level: G 3.0 credit hrs

[co-taught with Prof. Vasile Nistor]

This course helps students to develop methods and skills necessary to create, develop and execute a successful research career. Methods covered include: formulating and defining ideas, understanding and using appropriate resource management, gathering and assessing data, designing a complete research project and basic writing skills for manuscript preparation and grant writing.

BME 601 *Biomedical Engineering Survey* Level: U, G 3.0 credit hrs

[taught alone and co-taught with Prof. Daria Narmoneva]

Survey of biomedical engineering research topics.

BME 306 *Modeling and Analysis of Systems* Level: U 4.0 credit hrs

Tools for modeling and analysis of biomedical engineering systems and processes. Fundamentals of signal analysis. Lumped-element models for first and second-order electrical and mechanical systems. System analysis using differential equations, impedance relationships, and transfer functions. Solution of model equations and data analysis using MATLAB programming. Laboratory exercises including fundamentals, time response and frequency response of electrical and mechanical systems.

BME 305 *Modeling and Analysis of Systems* Level: U 3.0 credit hrs

Modeling and analysis of electrical, mechanical, fluid and thermal systems using Laplace transforms and state space methods. Time response and second order systems. Solution of model equations with MATLAB.

Guest lectures in UC Courses

CSD 9088	*Grant Writing and Reviewing*	Fall 2016–2017
BME 7001	*Biomedical Engineering Survey*	Fall 2013–2017
BME 611	*Imaging without Ionizing Radiation*	Spring 2005–2010
BME 601	*Biomedical Engineering Survey*	Fall 2005–2010
BME 210	*Biomedical Engineering in the Clinical Environment*	Fall 2008
BME 610	*Imaging with Ionizing Radiation*	Winter 2007
BME 701	*Biomedical Engineering Seminar*	Fall 2005

Penn State Graduate Program in Acoustics

ACS 597C	*Acoustic Scattering*	Spring 2000

Trainees Advised

Postdoctoral Trainees

Trainee	Position	Supervisor	Dates
Sunethra Dayavansha	Postdoctoral Fellow, Biomedical Engineering	Mast	2018–
Fong Ming Hooi	Postdoctoral Fellow, Biomedical Engineering	Mast	2012–2015
Joseph Serrone	Research Fellow, UC College of Medicine	Mast/Zuccarello	2011–2012
Kevin Haworth	Postdoctoral Fellow, UC College of Medicine	Holland/Mast	2009–2012
Saurabh Datta	Postdoctoral Fellow, Biomedical Engineering	Mast/Haridas	2008

UCBME graduate students (primary advisor)

Student	Admitted	Qualifier	Candidacy	Defense
Michael Cox (PhD)	Fall 2016	November 2017		
Mohamed Abbass (PhD)	Fall 2015	August 2016	November 2017	July 2018
Dissertation: Real-Time Control of Ultrasound Thermal Ablation using Echo Decorrelation Imaging Feeback				
Kyle Rich (PhD)	Fall 2008	June 2010	June 2016	February 2017
Dissertation: Characterization of Cavitation Effects in Therapeutic Ultrasound: Sonophoresis Experiments and Quantitative Emission Measurements				
Tyler Fosnight (MS)	Fall 2012	NA	NA	August 2015
Thesis: Echo Decorrelation Imaging of *In Vivo* HIFU and Bulk Ultrasound Ablation				
Anna Jackson Nagle (PhD)	Fall 2006	April 2008	July 2013	July 2015
Dissertation: Biomechanical Measurements of the Human Female Levator Ani Muscle *Ex Vivo* and *In Vivo*				
Swetha Subramanian (PhD)	Fall 2006	April 2008	August 2013	October 2014
Dissertation: Thermal Ablation Monitoring using Echo Decorrelation Imaging				
Chandrapriya Karunakaran (PhD)	Fall 2005	May 2007	March 2009	August 2011
Dissertation: Role of Cavitation during Bulk Ultrasound Ablation: *Ex vivo* and *In Vivo* Studies				
Vasant Salgaonkar (PhD)	Fall 2005	May 2007	December 2007	October 2009
Dissertation: Passive Imaging and Measurements of Acoustic Cavitation during Ultrasound Ablation				

UC graduate students (committee member)

Student	Program	Advisor	Qualifier	Candidacy	Defense
Michael Rollins	BME PhD	L. Oren	April 2018		
Nick Tassos	BME MEng	J. Johnson			April 2017
Chukwuemeka Chikelu	BME MS	D. Narmoneva			July 2016
Carson Willey	Aerospace Eng. PhD	F. Simonetti		April 2015	March 2016
Jason Raymond	BME PhD	C. Holland	June 2011	Dec. 2014	March 2015
Hodari Sadiki-James	BME MS	D. Narmoneva			Oct. 2014
Matthew Gruber	BME MS	C. Holland			July 2014
Jonathan Sutton	BME PhD	C. Holland	June 2010	Oct. 2012	March 2014
Kirthi Radhakrishnan	BME PhD	C. Holland	May 2009	June 2012	Nov. 2013
Shenwen Huang	BME MD/PhD	C. Holland	Nov. 2013		
Andrew Dunn	BME MS	B. Haridas			Oct. 2013
Katie Schappacher	Pharmacol. PhD	K. Jones/C. Holland	Oct. 2013		
Alex Bell	BME PhD	V. Nistor	Sept. 2012		
Jonathan Dudley	BME PhD	J.-H. Lee		Feb. 2011	June 2012
Rebecca Nesbitt	BME PhD	J. Shearn	May 2012		
Amal Chaturvedi	ECE MS	H. Fan			Oct. 2011
Jonathan Kopechek	BME PhD	C. Holland	April 2008	April 2010	Aug. 2011
Swathi Balaji	BME PhD	D. Narmoneva	May 2007	Feb. 2010	Sept. 2010
Kathryn Hitchcock	BME MD/PhD	C. Holland	May 2008	Dec. 2009	May 2010
Stephen Perrin	BME PhD	C. Holland	Nov. 2009		
Subramanian Venkatesh	BME PhD	M. B. Rao	May 2009		
Daniel Boguszewski	BME PhD	J. Shearn	May 2009		
Ashok Nageswaran	Mech. Eng. MS	B. Haridas			Nov. 2008
Xin Wang	BME PhD	J.-H. Lee		July 2006	Aug. 2008
Saurabh Datta	BME PhD	C. Holland	May 2005	Nov. 2005	Sept. 2007
Denise Smith	BME MD/PhD	C. Holland		July 2006	May 2007
Volodymyr Nahirnyak	Physics PhD	R. Endorf/C. Holland			Aug. 2006

UC students (research supervisor); undergraduates unless noted otherwise

Student	Program	Position	Terms
David Johnstone	Med. Phys. DMP	Research practicum	18US
Hannah Woeste	BME	Research co-op	18US
Peter Grimm	ECE	Research co-op	18SS
Jack Masterson	BME	Research co-op	18SS
Sameer Krothapalli	BME	Research co-op	17FS
Eva Sofge	EnvE	Research asst.	17SS
Allison-Joy Garbo	BME	Research co-op	17SS
Neeraja Mahalingam	BME	Research co-op/asst.	16US–18SS
Jakob Killin	BME	Research co-op	16SS–17US
Erico di Consolo Gregorio	BME	Independent study	16SS–16US
Alexander Ross	BME	Research co-op/asst.	15US–15FS
Jacob Stegman	BME PhD	Independent study	15SS
Temiloluwa Adeniyi	BME	NSF REU fellow	15SS

Student	Program	Position	Terms
Teckla Akinyi	BME PhD	Research Asst.	14FS–15SS
Nathan Gordon	MSTP MD/PhD	Research rotation	14US
Avery Maddox	BME	Independent study	14US
Samantha Imfeld	Biology	WISE fellow	14US
Ryan Keil	BME	Research co-op	14SS–US
Sadie Colbert	BME	Research co-op	13FS
Cameron Hoerig	ECE	Research co-op/capstone	12W–13WS
Lauren Lefferson	BME	Research capstone	12FS–13WS
Daniel Schmidt	BME	Research capstone	12FS–13WS
Nicholas Corregan	BME	Research co-op/capstone	12S–13WS
Mark Burgess	BME	Research co-op/capstone	08S–08U, 09S–10S
Jason Kleinhenz	BME	Research asst.	09S–09A
Molly Perdrix	BME	WISE Fellow	09U
Matthew Gruber	BME PhD	Research Rotation	09S
Amel Alqadah	BME	Research co-op	07A–08W, 08A–09W
Eileen Slavin	Biology	WISE fellow	08U
Kirthi Radhakrishnan	BME PhD	Research Rotation	08S
William Bowlus	BME	Research co-op	07S–07U
Daniel Pucke	BME	Research co-op	06A–07W
Grace Heinlein	Chem. Eng.	WISE fellow	06U
John Besse	BME	Research co-op	06S–06U
Jennifer Balitsis	Dietetics	WISE fellow	05U

Penn State students, 1998–2001

James Kelly	Math BS honors thesis advisor
Subha Maruvada	Acoustics PhD committee
Michelle Swearingen	Acoustics PhD committee
John Preston	Acoustics PhD committee
Janelle Hauser	Acoustics MS committee

Professional Activities and Service

UC department-level service

MEng advisor, BME, 2017–
Scholarship Oversight Committee for K. Haworth, Internal Medicine 2015–
BME undergraduate student advising 2010–2012, 2015–
BME Program Chair 2012–2017
BCEE Appointment, Reappointment, Promotion, and Tenure Committee 2016–2017
Chair, BME faculty search committees 2013–2017
BCEE Academic Leave Commitee 2012–2017
Reviewer, BCEE Seed Grant program 2014
BCEE Department Head search committee 2013–2014
BME Graduate Committee 2011–2012

BME ABET Coordinator	2010–2012
BME Undergraduate Curriculum Committee	2007–2012
BME graduate admissions, Medical Imaging subcommittee	2005–2012
BME graduate curriculum, Medical Imaging subcommittee	2005–2012
BME ABET accreditation application, Analytical Group	2005

UC college/university-level service

University Grievance Council	2018–
CEAS Appointment, Reappointment, Promotion, and Tenure Committee	2017–
Reviewer, Grants in Aid of Research, UC Sigma Xi Chapter	2014
University Research Council, Subcommittee on Engineering and Physics	2010–2012
Physician Scientist Training Program Executive Committee	2010–2012
Infrastructure Technology Planning Committee	2008–2012
Faculty Senate Information Technology Comittee	2007–2009

NIH review service

CSR BMIT-B Study Section	SA: Bradley	2016–2017
CSR BMIT-A Study Section	SA: Shabestari	2011–2015
CSR International and Cooperative Projects Study Section	SA: Gerendasy	2009
CSR Special Emphasis Panel ZRG SBIB-V	SA: Firrell	2009
NIBIB Special Emphasis Panel ZEB1 OSR-B	SA: Zhou	2008
CSR Innovative Ultrasound and Imaging Study Section	SA: Sastre	2007
NCI Special Emphasis Panel ZCA1 GRB-W	SA: Sastre	2006
NCI Diagnostic Imaging Study Section	SA: Rosen	1999–2000

Other scientific grant review service

Focused Ultrasound Foundation Research Award Program	2017
DoD/USAMRMC Peer Reviewed Medical Research Program Discovery Award, Pain Medicine panel	2017
Global Cardiovascular Innovation Center/NIH Center for Accelerated Innovations	2015–2017
DoD/USAMRMC Peer Reviewed Medical Research Program Discovery Award, Pulmonary Fibrosis panel	2015
Hungarian Scientific Research Fund (OTKA)	2014
Iowa SBIR/STTR Outreach Program	2013
Bankhead Coley Cancer Research Program, Florida Department of Health	2010

Archival journal editorial service

Associate Editor, Journal of Therapeutic Ultrasound	2016–
Associate Editor, Ultrasonic Imaging	2014–
Associate Editor, JASA Express Letters	2012–
Editorial Board, Journal of Therapeutic Ultrasound	2014–2016
Editorial Board, Ultrasound in Medicine and Biology	2011–
Associate Editor, Journal of the Acoustical Society of America	2003–2012
Editorial Board, Recent Patents in Engineering	2006–2010

Ad hoc reviewer for archival journals

ASME Journal of Computational and Nonlinear Dynamics
Biomedical Engineering Online
Biomedical Physics & Engineering Express
Communications in Computational Physics
Computer Methods and Programs in Biomedicine
European Surgical Research
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Medical Imaging
IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control
IETE Technical Review
International Journal of Hyperthermia
International Journal of Modelling and Simulation
International Journal of Nanomedicine
International Journal for Numerical methods in Biomedical Engineering
Inverse Problems
Journal of the Acoustical Society of America
Journal of Biomechanics
Journal of Computational and Nonlinear Dynamics
Journal of the Optical Society of America
Journal of Physics A
Measurement Science and Technology
Medical Physics
Physics in Medicine and Biology
Physiological Measurement
Recent Patents in Engineering
Review of Scientific Instruments
Scientific Reports (Nature Research)
Ultrasonic Imaging
Ultrasonics
Ultrasound in Medicine and Biology
Wave Motion

Professional societies

Acoustical Society of America
Fellow, 2007–
Committee on Prizes and Special Fellowships, 2016–
Committee on Public Relations, 2013–
Biomedical Acoustics Technical Committee, 2010–
Biomedical Acoustics representative to JASA Subject Classification Committee, 2011–2013
Biomedical Ultrasound/Bioresponse to Vibration Technical Committee, 2004–2010
Organized and chaired special sessions for Society meetings: 1998, 2001, 2005
Member, 1989–2007

American Association of Physicists in Medicine
Abstract reviewer, 59th Annual Meeting, 2017

Sigma Xi, The Scientific Research Society
Member, 2013–

American Institute of Ultrasound in Medicine
Senior Member, 2012–
Senior Member application reviewer, 2016
Endowment for Education and Research Committee, 2009–2012
Abstract reviewer, 2010 Convention
Member, 1996–2012

Institute of Electrical and Electronics Engineers
Ultrasonics, Ferroelectrics, and Frequency Control Society
Member, 1997–

Acoustical Society of America, Central Pennsylvania Chapter
President, 1999–2000
Vice President, 1998–1999
Member, 1996–2001

Consultant on biomedical ultrasound

Piezo Energy Technologies LLC	2012–
School of Osteopathic Medicine, A.T. Still University	2011–
Lytmos Group LLC	2010–
Orison Corporation	2005–2006
Guided Therapy Systems Inc.	2004
Applied Research Laboratory, Penn State University	2001–2004

Funding Support

Active/completed extramural research programs at UC as PI or co-PI

Agency / Number	Title	PI	Effort	Total Funding	Annual Directs	Duration
NIH R01 DC017301	Simplified ultrasound biofeedback for speech remediation	Boyce/ Mast/Riley	25%			2018–2023
NIH R01 CA158439	Monitoring and control of human liver cancer ablation using real-time, 3D echo decorrelation imaging	Mast	18%	$1,869,026	$326,371	2018–2023
Procter & Gamble Co. Contract	High-frequency ultrasonic imaging of skin elasticity *in vivo*	Mast/ Rubinstein	60 hrs.	$204,200	$65,097	2018–2020
NIH R01 CA158439	Real-time prediction of thermal ablation-induced cell death by echo decorrelation imaging	Mast	25%	$1,563,333	$234,199	2012–2018
NIH R21 EB008483	Passive cavitation imaging for guidance and control of ultrasound ablation	Mast	20%	$387,043	$150,000	2009–2013
NSF/MIMTeC UC_07_02	Image based deformation analysis for soft tissues: internal organs	Mast / Haridas	11%	$136,000	$31,847	2007–2010
NSF/MIMTeC UC_09_01	Ultrasound-mediated dermal and transdermal drug delivery	Mast	11%	$100,000	$47,619	2009–2011

Mayfield Education and Research Foundation	Controlled occlusion of large arteries and veins in rabbits with extracorporeal HIFU	Mast / Zuccarello	NA	$30,186	$30,186	2007–2011
American Institute of Ultrasound in Medicine (EER)	Quantitative real-time monitoring of thermal ablation by pulse-echo ultrasound imaging	Mast	1.5%	$10,000	$10,000	2006–2007

Intramural research programs at UC as PI or co-PI

Source	Title	PI	Effort	Total Funding	Duration
VP for Res. Collaborative Research Advancement Grants Program	Passive acoustic imaging for absolute radiotherapy dosimetry	Mast	NA	$25,000	2018–2019
University Research Council Strategic Collaborative Grant Program	Improving speech motor performance with simplified visual targets from ultrasound	Boyce/Mast /Riley	NA	$99,544	2016–2018
CoM Dean's Bridge Funding Program	Passive cavitation imaging for guidance and control of ultrasound ablation	Mast	NA	$30,000	2008–2009
UC Cancer Center Pilot Grant	Real-time ultrasound monitoring of *in vivo* radiofrequency ablation	Mast	NA	$29,000	2007–2008

Other funding support at UC

Doctoral fellowship, Egyptian Armament Authority, Arab Republic of Egypt, 2015–2018
Recipient: Mohamed Abbass; Advisor: Mast
Fully paid tuition and living expenses, 3 years

NIH R43 EB019225, 2014–2015
Enhancing longevity of implanted medical devices (PI: Radziemski)
Consultant, 40 hours budgeted

NSF Academic Year Research Experience for Undergraduates (AY-REU), 2015
Spatio-temporal temperature prediction during ultrasound thermal ablation using echo decorrelation
Recipients: Temiloluwa Adeniyi; Mentor: Mast
Total funding: $2,000

UC Graduate Summer Undergraduate Mentoring program, 2014
Assessment of echo decorrelation for real-time thermal ablation monitoring
Recipients: Tyler Fosnight, Ryan Keil; Mentor: Mast
Total funding: $5,000

Sigma Xi Grant-in-Aid of Research, 2013
An infrared system for measuring tissue temperature during radiofrequency ablation in real time
Recipient: Tyler Fosnight; Mentor: Mast
Total funding: $3,000

NIH R01 NS047603, 2009–2013
Ultrasound-assisted thrombolysis for stroke therapy (PI: Holland)
Co-investigator, 4% effort

IGERT Fellowship, National Science Foundation, 2011–2012
Recipient: Kyle Rich; Mentor: Mast
Total funding: $30,000

Mayfield Education and Research Foundation Grant, 2011–2013
High-intensity focused ultrasound (HIFU) with cavitation feedback intensity modulation (CFIM): a novel technique for safer non-invasive vascular occlusion
Recipient: Joseph Serrone; Mentors: Mast, Zuccarello
Total funding: $49,800

STEP Fellowship, National Science Foundation, 2010–2012
Recipient: Anna Nagle; Mentor: Mast
Total funding: $30,000

PES0632-1, Ohio Supercomputer Center, 2010
5000 Resource Units

Rindsberg Fellowship, UC Preparing Future Faculty in Engineering program, 2009
Recipient: Vasant Salgaonkar; Mentor: Mast
Total funding: $10,000

Summer Graduate Student Research Fellowship, UC University Research Council, 2009
Recipient: Swetha Subramanian; Supervisor: Mast
Total funding: $3,000

Summer Graduate Student Research Fellowship, UC University Research Council, 2009
Recipient: Vasant Salgaonkar; Supervisor: Mast
Total funding: $3,000

UC Faculty Development Council Award
Development of knowledge and skills in transabdominal ultrasound imaging, 2008
Total funding: $3,972

Summer Graduate Student Research Fellowship, UC University Research Council, 2008
Recipient: Chandrapriya Karuankaran; Supervisor: Mast
Total funding: $3,000

NSF Research Co-op grant distribution, 2008
Funded student: Mark Burgess; Supervisor: Mast
Total funding: $5,000

In-kind equipment donation to Biomedical Acoustics Laboratory from Ethicon Endo-Surgery, 2005
Estimated value: $20,000

Funding support at Penn State

IDEA award, DoD Prostate Cancer Research Program, 2002–2005
Optimized hyperthermia treatment of prostate cancer using a novel intracavitary ultrasound array
PI Smith, original co-PI Mast; Total funding $314,000

IDEA award, DoD Breast Cancer Research Program, 2002–2005
High resolution breast tissue mapping by adaptive pulse-echo ultrasound
PI Tutwiler, original PI Mast; total funding $300,000

IDEA award, DoD Breast Cancer Research Program, 1998–2001
Quantitative three-dimensional ultrasonic mammography.
PI Mast; total funding $300,000

Scholarly Publications

[UC student/trainee co-authors I have advised are *italicized*.]

Peer-Reviewed Journal Articles

Rich KT, Holland CK, Rao MB, **Mast TD**. Characterization of cavitation-radiated acoustic power using diffraction correction. J Acoust Soc Am; submitted (2018).

Hamilton Dugan S, *Mahalingam Neeraja*, Annand CT, Walton A, *Garbo, AJ*, *Masterson JA*, Riley, MA, **Mast TD**, Boyce SE. Quantification of tongue part displacements during /r/ production using ultrasound imaging. Speech Comm; revised (2018).

Abbass MA, *Garbo AJ*, *Mahalingam N*, *Killin J*, **Mast TD**. Optimized echo decorrelation imaging feedback for bulk ultrasound ablation control. IEEE Trans Ultrason Ferroelectr Freq Control; in press (2018).

Abbass MA, *Killin JK*, *Mahalingam N*, *Hooi FM*, Barthe PG, **Mast TD**. Real-time spatiotemporal control of high-intensity focused ultrasound thermal ablation using echo decorrelation imaging in *ex vivo* bovine liver. Ultras Med Biol **44**, 199–213 (2018).

Haworth KJ, Bader KB, *Rich KT*, Holland CK, **Mast TD**. Quantitative frequency-domain passive cavitation imaging. IEEE Trans Ultrason Ferroelectr Freq Control **64**, 177–191 (2017).

Fosnight TR, *Hooi FM*, *Keil RD*, *Ross AP*, *Subramanian S*, *Killin JK*, *Akinyi TG*, Barthe PG, Rudich SM, Ahmad SA, Rao MB, **Mast TD**. Echo decorrelation imaging of rabbit liver and VX2 tumor during in vivo ultrasound ablation. Ultras Med Biol **43**, 176–186 (2017).

Subramanian SE, *Schmidt DT*, Rao MB, **Mast TD**. Dependence of ultrasound echo decorrelation on local tissue temperature during *ex vivo* radiofrequency ablation. Phys Med Biol **61**, 2356–2371 (2016).

Rich KT, **Mast TD**. Accuracy of a bistatic scattering substitution technique for calibration of focused receivers. J Acoust Soc Am **138**, EL469–EL473 (2015).

Rich KT, **Mast TD**. Methods to calibrate the absolute receive sensitivity of single-element, focused transducers. J Acoust Soc Am **138**, EL193–EL198 (2015).

Subramanian SE, **Mast TD**. Optimization of tissue physical parameters for accurate temperature estimation from finite-element simulation of radiofrequency ablation. Phys Med Biol **60**, N345–N355 (2015).

Haworth KJ, *Salgaonkar VA*, *Corregan NM*, Holland CK, **Mast TD**. Using passive cavitation images to classify high-intensity focused ultrasound lesions. Ultras Med Biol **41**, 2420–2434 (2015).

Hooi FM, *Nagle S*, *Subramanian S*, **Mast TD**. Analysis of tissue changes, measurement system effects, and motion artifacts in echo decorrelation imaging. J Acoust Soc Am **37**, 585–597 (2015).

Rich KT, *Hoerig CL*, Rao MB, **Mast TD**. Relations between acoustic cavitation and skin permeability during intermediate- and high-frequency sonophoresis. J Controlled Release **94**, 266–277 (2014).

Hoerig CL, *Serrone JC*, *Burgess MT*, Zuccarello M, **Mast TD**. Prediction and suppression of HIFU-induced vessel rupture using passive cavitation detection in an *ex vivo* model. J Therapeutic Ultras **2**:14, 1–18 (2014).

Subramanian S, Rudich SM, *Karunakaran CP*, Rao MB, **Mast TD**. *In vivo* thermal ablation monitoring using ultrasound echo decorrelation imaging. Ultras Med Biol **40**, 102–114 (2014).

Nagle AS, Barker MA, Kleeman SD, Haridas B, **Mast TD**. Passive biomechanical properties of human cadaveric *levator ani* muscle at low strains. J Biomech **47**, 583–586 (2014).

Haworth KJ, **Mast TD**, *Radhakrishnan K.*, *Burgess MT*, *Kopechek JA*, Huang S, McPherson DD, Holland CK. Passive cavitation imaging with pulsed ultrasound insonations. J Acoust Soc Am **132**, 544–553 (2012).

Serrone J, Kocaeli H, **Mast TD**, *Burgess MT*, Zuccarello M. The potential applications of high-intensity focused ultrasound (HIFU) in vascular neurosurgery. J Clin Neurosci **19**, 214–221 (2012).

Kopechek JA, *Haworth KJ*, *Raymond JL*, **Mast TD**, *Perrin SR*, Klegerman ME, Huang S, Porter TM, McPherson DD, Holland CK. Acoustic characterization of echogenic liposomes: frequency-dependent attenuation and backscatter. J Acoust Soc Am **130**, 3472–3481 (2011).

Mast TD, Barthe PG, Makin IRS, Slayton MH, *Karunakaran CP*, *Burgess MT*, *Alqadah AF*, Rudich SM. Treatment of rabbit liver cancer *in vivo* using miniaturized image-ablate ultrasound arrays. Ultrasound Med Biol, **37**, 1609–1621 (2011).

Mast TD. Convolutional modeling of diffraction effects in pulse-echo ultrasound imaging. J Acoust Soc Am, **128**, EL99–EL104 (2010).

Salgaonkar VA, *Datta S*, Holland CK, **Mast TD**. Passive cavitation imaging with ultrasound arrays. J Acoust Soc Am **126**, 3071–3083 (2009).

Mast TD, *Pucke DP*, *Subramanian SE*, *Bowlus WJ*, Rudich SM, Buell JF. Ultrasonic monitoring of *in vitro* radiofrequency ablation by echo decorrelation imaging. J Ultrasound Med **27**, 1685–1697 (2008).

Ammi AY, **Mast TD**, Huang IH, Abruzzo TA, Coussios CC, Shaw GJ, Holland CK. Characterization of ultrasound propagation through *ex-vivo* human temporal bone. Ultrasound Med Biol **34**, 1578–1589 (2008).

Mast TD, *Salgaonkar VA*, *Karunakaran CP*, *Besse JA*, *Datta S*, Holland CK. Acoustic emissions during 3.1 MHz ultrasound bulk ablation *in vitro*. Ultrasound Med Biol **34**, 1434–1448 (2008).

Datta S, Coussios CC, Ammi AY, **Mast TD**, de Courten-Myers GM, Holland CK. Ultrasound-enhanced thrombolysis using Definity as a cavitation nucleation agent. Ultrasound Med Biol **34**, 1421–1433 (2008).

Mast TD. Fresnel approximations for ultrasonic fields of rectangularly symmetric sources. J Acoust Soc Am **121**, 3311–3322 (2007).

Nahirnyak VM, **Mast TD**, Holland CK. Ultrasound-induced thermal elevation in clotted blood and cranial bone. Ultrasound Med Biol **33**, 1285–1295 (2007).

Al-Bataineh OM, **Mast TD**, Park EJ, Sparrow VW, Keolian RM, Smith NB. Utilization of the k-space method in the design of a ferroelectric hyperthermia phased array. Ferroelectrics **331**, 103–120 (2006).

Mast TD, Yu F. Simplifed expansions for radiation from a baffled circular piston. J Acoust Soc Am **118**, 3457–3464 (2005).

Makin IRS, **Mast TD**, Faidi W, Runk MM, Barthe PG, Slayton MH. Miniaturized ultrasound arrays for interstitial ablation and imaging. Ultras Med Biol **31**, 1539–1550 (2005).

Mast TD, Makin IRS, Faidi W, Runk MM, Barthe PG, Slayton MH. Bulk ablation of soft tissue with intense ultrasound: modeling and experiments. J Acoust Soc Am **118**, 2715–2724 (2005).

Tabei M, **Mast TD**, Waag RC. Simulation of ultrasonic focus aberration and correction through human tissue. J Acoust Soc Am **113**, 1166–1176 (2003).

Mast TD. Aberration correction for time-domain ultrasound diffraction tomography. J Acoust Soc Am **112**, 55–64 (2002).

Jansson T, Jurkonis R, **Mast TD**, Persson HW, Lindström K, Frequency dependence of speckle in continuous-wave ultrasound: implications for blood perfusion measurements. IEEE Trans Ultrason Ferroelectr Freq Contr **49**, 715–725 (2002).

Mast TD. Two- and three-dimensional simulations of ultrasonic propagation through human breast tissue. Acoustics Research Letters Online **3**, 53–58 (2002).

Tabei M, **Mast TD**, Waag RC. A *k*-space method for coupled first-order acoustic propagation equations. J Acoust Soc Am **111**, 53–63 (2002).

Mast TD, Mast TE. The German roots of Nicholas Stoltzfus. Pennsylvania Mennonite Heritage **25**, 20–23 (April 2002).

Mast TD, Gordon GA. Quantitative flaw reconstruction from ultrasonic surface wavefields measured by electronic speckle pattern interferometry. IEEE Trans Ultrason Ferroelectr Freq Contr **48**, 432–444 (2001).

Mast TD, Souriau LP, Liu DL, Tabei M, Nachman AI, Waag RC. A *k*-space method for large-scale models of wave propagation in tissue. IEEE Trans Ultrason Ferroelectr Freq Contr **48**, 341–354 (2001).

Mast TD. Empirical relationships between acoustic parameters in human soft tissues. Acoustics Research Letters Online **1**, 37–42 (2000).

Mast TD. Wideband quantitative ultrasonic imaging by time-domain diffraction tomography. J Acoust Soc Am **106**, 3061–3071 (1999).

Mast TD, Hinkelman LM, Metlay LA, Orr MJ, Waag RC. Simulation of ultrasonic pulse propagation, distortion, attenuation in the human chest wall. J Acoust Soc Am **106**, 3665–3677 (1999).

Mast TD, Hinkelman LM, Orr MJ, Waag RC. The effect of abdominal wall morphology on ultrasonic pulse distortion. Part II: Simulations. J Acoust Soc Am **104**, 3650–3664 (1998).

Hinkelman LM, **Mast TD**, Metlay LA, Waag RC. The effect of abdominal wall morphology on ultrasonic pulse distortion. Part I: Measurements. J Acoust Soc Am **104**, 3635–3649 (1998).

Mast TD, Hinkelman LM, Orr, MJ, Sparrow VW, Waag RC. Erratum: Simulation of ultrasonic pulse propagation through the abdominal wall. J Acoust Soc Am **104**, 1124–1125 (1998).

Jansson TT, **Mast TD**, Waag RC. Measurements of differential scattering cross-section using a ring transducer. J Acoust Soc Am **103**, 3169–3179 (1998).

Mast TD, Nachman AI, Waag RC. Focusing and imaging using eigenfunctions of the scattering operator. J Acoust Soc Am **102**, 715–725 (1997).

Mast TD, Hinkelman LM, Orr MJ, Sparrow VW, Waag RC. Simulation of ultrasonic pulse propagation through the abdominal wall. J Acoust Soc Am **102**, 1177–1190 (1997).

Mast TD, Waag RC. Wave space resolution in ultrasonic scattering measurements. J Acoust Soc Am **98**, 3050–3058 (1995).

Mast TD, Pierce, AD. A theory of aneurysm sounds. J Biomech **28**, 1045–1053 (1995).

Mast TD, Pierce AD. Describing-function theory for flow excitation of resonators. J Acoust Soc Am **97**, 163–172 (1995).

Book Chapter

Mast TD. Helmholtz resonator. In *McGraw-Hill Encyclopedia of Science and Technology*, 10th Edition (2007).

Issued Patents

CK Holland, S Datta, **TD Mast**, N Ivancevich, KE Hitchcock, K Haworth. Ultrasound-mediated inducement, detection, and enhancement of stable cavitation. US patent 9,675,820 (2017).

CK Holland, KE Hitchcock, K Haworth, N Ivancevich, **TD Mast**. Methods of enhancing delivery of drugs using ultrasonic waves and systems for performing the same. US patent 9,669,203 (2017).

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH. Method for monitoring of medical treatment using pulse-echo ultrasound. US patent 9,261,596 B2 (2016).

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH. System and method for ultrasound treatment using grating lobes. US Patent 9,132,287 (2015).

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM, Jaeger PM. Ultrasound Medical System. US Patent 7,951,095 (2011).

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM. Medical system having an ultrasound source and an acoustic coupling medium. US Patent 7,883,468 (2011).

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH. Method for monitoring of medical treatment using pulse-echo ultrasound. US Patent 7,846,096 (2010).

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH. System and method for ultrasound therapy using grating lobes. US Patent 7,806,839 (2010).

Mast TD, Barthe PG, Jaeger PM, Faidi W, Leonard SP, Slayton MS. Transmit apodization of an ultrasound transducer array. US Patent 7,695,436 (2010).

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM. Medical system having multiple ultrasound transducers or an ultrasound transducer and an RF electrode. US Patent 7,494,467 (2009).

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM, O'Connor BD, Park CJ, Jaeger PM. Ultrasound medical system and method. US Patent 7,473,250 (2009).

Mast TD, Faidi W. Method for mapping temperature rise using pulse-echo ultrasound. US Patent 7,211,044 (2007).

Published Patent Applications

Barthe PG, Slayton MS, Jaeger PM, **Mast TD**, Makin IRS, O'Connor BD, Messerly JD, Faidi W, Runk MM, Park CJ. Ultrasound Medical System and Method. US 20130218013A1, Application No. US 13/752151.

Holland CK, *Hitchcock KE*, *Haworth K*, Ivancevich N, **Mast TD**. Methods of enhancing delivery of drugs using ultrasonic waves and systems for performing the same. US 20120271167A1, Application No. 13/409634.

Holland CK, *Datta S*, **Mast TD**, Ivancevich N, *Hitchcock KE*, *Haworth K*. Ultrasound-mediated inducement, detection, and enhancement of stable cavitation. US 20120130288 A1, Application No. 13/257657.

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH, Method for Monitoring of Medical Treatment using Pulse-Echo Ultrasound. US 20110040184 A1, Application No. 12/915358.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM, Jaeger PM. Ultrasound Medical System. US 20110201975 A1, Application No. 13/091693.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM. Medical system having an ultrasound source and an acoustic coupling medium. US 20100256490 A1, Application No. 12/818261.

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH. System and method for medical treatment using ultrasound. US 20100312150 A1, Application No. 12/857653.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM. Medical system having an ultrasound source and an acoustic coupling medium. US 20100256490 A1, Application No. 12/818261.

Mast TD, Faidi W, Makin IRS, Runk MM, Slayton MH, Barthe PG. Ultrasound medical treatment system and method. US 20090198156 A1, Application No. 12/422340.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM, O'Connor BD, Park CJ, Jaeger PM. Ultrasound medical system and method. US 20080287837 A1, Application No. 12/145635.

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH. System and method for medical treatment using ultrasound. US 20050277853 A1, Application No. 10/867170.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM, O'Connor BD, Park CJ, Jaeger PM. Ultrasound medical system and method. 20050261611 A1, Application No. 10/850984.

Mast TD, Barthe PG, Jaeger PM, Faidi W, Leonard SP, Slayton MH. Transmit apodization of an ultrasound transducer array. US 20050261610, Application No. 10/850959.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W. Ultrasound medical system. 20050261588 A1, Application No. 10/850983.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W. Ultrasound medical system and method. US 20050261587 A1, Application No. 10/850041.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM, Medical system having an ultrasound source and an acoustic coupling medium. US 20050261586 A1, Application No. 10/848550.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM, Jaeger PM. Ultrasound medical system. 20050261585 A1, Application No. 10/850038.

Makin IRS, **Mast TD**, Slayton MH, Barthe PG, Messerly JD, Faidi W, Runk MM. Medical system having multiple ultrasound transducers or an ultrasound transducer and an US 20050240125 A1, Application No. 10/825952.

Mast TD, Faidi W, Makin IRS, Runk MM, Barthe PG, Slayton MH. Ultrasound Medical Treatment System and Method. US 20050240124 A1, Application No. 10/825090.

Mast TD, Faidi W, Makin IRS, Slayton MH, Barthe PG, Ultrasound medical treatment system and method. US 20050240123 A1, Application No. 10/824196.

Mast TD, Faidi W, Makin IRS, Barthe PG, Slayton MH, Kouklev VW. Method for reducing electronic artifacts in ultrasound imaging. US 20050240105 A1, Application No. 10/824624.

Mast TD, Faidi W, Makin IRS, Runk MM, Barthe PG, Slayton MH, Ultrasound medical treatment system and method. US 20050234438 A1, Application No. 10/825092.

Messerly JD, Slayton MH, Nuchols R, Makin IRS, Barthe PG, **Mast TD**. Medical system having a rotatable ultrasound source and piercing tip. US 20050228286 A1, Application No. 10/819726.

Mast TD, Faidi W. Method for mapping temperature rise using pulse-echo ultrasound. US 20040127791 A1, Application No. 10/735045.

Mast TD. Method for monitoring of medical treatment using pulse-echo ultrasound. US 20040106870 A1, Application No. 10/721034.

Makin IRS, **Mast TD**. Ultrasound feedback in medically-treated patients. US 20030069502 A1, Application No. 10/153241.

Makin IRS, **Mast TD**. Method for aiming ultrasound for medical treatment. US 20030032898 A1, Application No. 10/152769.

Dunki-Jacobs RJ, Makin IRS, **Mast TD**. Method for aiming ultrasound for medical treatment. CA 2449015A1, Application No. PCT/US2002/016700.

Dunki-Jacobs RJ, Makin IRS, **Mast TD**. Method for aiming ultrasound for medical treatment. CA 2448957A1, Application No. PCT/US2002/016695.

Dunki-Jacobs RJ, Makin IRS, **Mast TD**. Guiding ultrasound end effector for medical treatment. CA 2449012A1, Application No. PCT/US2002/016699.

Conference Proceedings

Abbass MA, *Garbo AJ*, *Mahalingam N*, *Killin JK*, **Mast TD**. Real-time control of bulk ultrasound thermal ablation using echo decorrelation imaging feedback. IEEE International Ultrasonics Symposium Proceedings, 978-1-5386-3383-0:8091539 (2017).

Cox MT, *Abbass MA*, *Garbo AJ*, **Mast TD**. Focused ultrasound ablation using electronically scanned grating lobes. IEEE International Ultrasonics Symposium Proceedings, 978-1-5386-3383-0:8091989 (2017).

Swanson DC, Mahon MP, Norris DN, **Mast TD**. Atmospheric multipath resolution using spread spectrum acoustic signals. Proceedings of Meetings on Acoustics **30**:045001 (2017).

Fosnight TR, *Hooi FM*, *Keil RD*, *Subramanian S*, Barthe PG, Wang Y, Ren X, Ahmad S, Rao MB, **Mast TD**. Motion-corrected echo decorrelation imaging of *in vivo* focused and bulk ultrasound ablation in a rabbit liver cancer model. IEEE International Ultrasonics Symposium Proceedings, 6932234:2161-2164 (2014).

Fosnight TR, *Hooi FM*, *Colbert SB*, *Keil RD*, Barthe PG, **Mast TD**. Echo decorrelation imaging of *ex vivo* focused and bulk ultrasound ablation using image-treat arrays. Proceedings from the 14th International Symposium on Therapeutic Ultrasound AIP Conf. Proc. 1821, 150006-1150006-5 (2014).

Nagle AS, Minoguchi R, Hansmann M, Norcom J, Haridas B, **Mast TD**. *In vivo* biomechanics properties of the pubovisceral muscle in incontinent and asymptomatic women. 2014 Midwest American Society of Biomechanics Regional Meeting proceedings, p. 40 (2014).

Haworth KJ, *Salgaonkar VA*, *Corregan NM*, Holland CK, **Mast TD**. Spatial specificity and sensitivity of passive cavitation imaging for monitoring high-intensity focused ultrasound thermal ablation in ex vivo bovine liver. Proceedings of Meetings on Acoustics **19**:075022 (2013).

Nagle AS, *Nageswaran AR*, Haridas B, **Mast TD**. Validation of three dimensional strain tracking by volumetric ultrasound image correlation in a pubovisceral muscle model. Proceedings of Meetings on Acoustics **19**:075053 (2013).

Rich KT, *Hoerig CL*, **Mast TD**. Cavitation mechanisms in ultrasound-enhanced permeability of ex vivo porcine skin. Proceedings of Meetings on Acoustics **18**:075002 (2012).

Hoerig CL, *Serrone JC*, *Burgess MT*, Zuccarello M, **Mast TD**. Acoustic emissions associated with ultrasound-induced rupture of *ex vivo* blood vessels. Proceedings of Meetings on Acoustics **18**:075001(2012).

Subramanian SE, Rudich SM, *Alqadah A*, *Karunakaran CP*, **Mast TD**. *In vivo* thermal ablation monitoring by echo decorrelation imaging. In *11th International Symposium on Therapeutic Ultrasound* (American Institute of Physics Conference Proceedings Vol. 1481, 2012), 374–380.

Karunakaran CP, Rudich SM, *Alqadah A*, *Burgess MT*, Narmoneva DA, **Mast TD**. Histologic analysis of rabbit liver cancer treated by bulk ultrasound ablation. In *11th International Symposium on Therapeutic Ultrasound* (American Institute of Physics Conference Proceedings Vol. 1481, 2012), 162–168.

Mast TD, *Subramanian SE*. Analytic and numerical modeling of ultrasonic B-scan and echo decorrelation imaging. Proceedings of Meetings on Acoustics **9**:020003–020003-14 (2010).

Mast TD, Barthe PG, Makin IRS, Slayton MH, *Karunakaran CP*, *Burgess MT*, *Alqadah AF*, Buell JF, Rudich SM. *In-vivo* treatment of VX2 tumor by miniaturized image-ablate ultrasound arrays. 2009 IEEE Ultrasonics Symposium Proceedings, 61–64.

Karunakaran CP, *Burgess MT*, Holland CK, **Mast TD**. Role of cavitation in bulk ultrasound ablation: a histologic study. In *Proceedings of 8th International Symposium on Therapeutic Ultrasound* (American Institute of Physics Conference Proceedings Vol. 1113, 2009), 43–47.

Salgaonkar VA, *Datta S*, Holland CK, **Mast TD**. Passive imaging of cavitational acoustic emissions with ultrasound arrays. In *Proceedings of 8th International Symposium on Therapeutic Ultrasound* (American Institute of Physics Conference Proceedings Vol. 1113, 2009), 73–77.

Salgaonkar VA, *Karunakaran CP*, *Besse JA*, *Heinlein G*, *Datta S*, Holland CK, **Mast TD**. Image-guided *ex vivo* liver ablation by unfocused ultrasound using passive cavitation detection. Proc SPIE **6440**, Q1–Q10 (2007).

Mast TD, *Salgaonkar VA*, *Karunakaran CP*, *Besse JA*, *Datta S*, Holland CK. Measurements of cavitation dose, echogenicity, temperature during ultrasound ablation. In *Therapeutic Ultrasound: 6th International Symposium on Therapeutic Ultrasound* (American Institute of Physics Conference Proceedings Vol. 911, 2007), 335–341.

Mast TD, Faidi W, Makin IRS. Acoustic field modeling in therapeutic ultrasound. In *Proceedings of the 17th International Symposium on Nonlinear Acoustics* (American Institute of Physics Conference Proceedings Vol. 838, 2006), 209–216.

Mast TD, Faidi W, Makin IRS. Acoustic propagation effects in therapeutic ultrasound. In *Proceedings of the 5th International Symposium on Therapeutic Ultrasound* (American Institute of Physics Conference Proceedings Vol. 829, 2006), 3–7.

Makin IRS, Faidi W, **Mast TD**, Runk MM, Slayton MH, Barthe PG. Conformal bulk ablation and therapy monitoring using intracorporeal image-treat ultrasound arrays. In *Proceedings of the 4th International Symposium on Therapeutic Ultrasound* (American Institute of Physics Conference Proceedings Vol. 754, 2005), 27–29.

Makin IRS, **Mast TD**, Faidi W, Runk MM, Barthe PG, Slayton MH. B-scan imaging and thermal lesion monitoring using miniaturized image-treat ultrasound arrays. 2004 IEEE Ultrasonics Symposium Proceedings, Vol. 2, 1788–1791.

Barthe PG, Slayton MH, Jaeger PM, Makin IRS, **Mast TD**, Faidi W, Runk MM, Gallagher LA. Ultrasound therapy system and ablation results utilizing miniature imaging/therapy arrays. 2004 IEEE Ultrasonics Symposium Proceedings, Vol. 2, 1792–1795.

Mast TD, Lin F, Waag RC. Time-domain ultrasound diffraction tomography. 1999 IEEE Ultrasonics Symposium Proceedings, Vol. 2, 1617–1620.

Mould JC, Wojcik GL, Carcione LM, Tabei M, **Mast TD**, Waag RC. Validation of FFT-based algorithms for large-scale modeling of wave propagation in tissue. 1999 IEEE Ultrasonics Symposium Proceedings, Vol. 2, 1551–1556.

Gordon GA, **Mast TD**. Wide-area imaging of ultrasonic Lamb wave fields by electronic speckle pattern interferometry. Proc SPIE **3586**, 297–309 (1999).

Myers, LF, Lovette M, Kilgus CC, Giannini JA, Swanson DC, Reichard KM, Mahon MP, **Mast TD**. Java-based information system for wayside sensing and control. Proceedings of the IEEE/ASME Joint Railroad Conference, 135–147 (1998).

Mast TD, Nachman AI, Liu DL, Waag RC. Quantitative imaging with eigenfunctions of the scattering operator. 1997 IEEE Ultrasonics Symposium Proceedings, Vol. 2, 1507–1510.

Hinkelman LM, **Mast TD**, Orr MJ, Waag RC, Effects of abdominal wall morphology on ultrasonic pulses. 1997 IEEE Ultrasonics Symposium Proceedings, Vol. 2, 1493–1496.

Mast TD. Limit cycles of flow-excited resonators: a describing-function analysis. In *Structural Acoustics, Scattering, and Propagation: Theoretical and Computational Acoustics—Volume I* (River Edge, New Jersey: World Scientific, 1994), 389–403.

Mast TD, Pierce AD. Flow-induced sounds associated with aneurysms. In *Flow Noise Modeling, Measurement, and Control* (New York: American Society of Mechanical Engineers, 1991), 129–134.

Published Abstracts

Abbass MA, *Mahalingam N*, *Krothapalli KS*, Ahmad SA, **Mast TD**. *In vivo* ultrasound thermal ablation controlled using echo decorrelation imaging. J Acoust Soc Am **143**, 1927 (2018).

Cox MT, *Abbass MA*, **Mast TD**. Simulation and analysis of three-dimensional echo decorrelation imaging. J Acoust Soc Am **143**, 1929 (2018).

Mast TD. Nucleation of a career in biomedical ultrasound. J Acoust Soc Am **142**, 2632 (2017).

Abbass MA, *Killin JK*, *Mahalingam N*, **Mast TD**. Real-time feedback control of high-intensity focused ultrasound thermal ablation using echo decorrelation imaging. J Acoust Soc Am **141**, 3550 (2017).

Rich KT, **Mast TD**. Characterization of cavitation-radiated acoustic power using single-element detectors. J Acoust Soc Am **141**, 3551 (2017).

Hamilton SM, Boyce S, *Mahalingam N*, *Garbo AJ*, Walton A, Riley MA, **Mast TD**. Measuring regional displacements of tongue parts on ultrasound during /?/ articulation. J Acoust Soc Am **141**, 3648 (2017).

Haworth KJ, Bader KB, *Rich KT*, Holland CK, **Mast TD**. Frequency-domain passive cavitation imaging. J Acoust Soc Am **141**, 3458 (2017).

Makin IRS, Radziemski L, Jabs H, **Mast TD**. In-vivo demonstration of a self-contained ultrasound-based battery charging approach for medical implants. J Acoust Soc Am **141**, 3956 (2017).

Holland CK, **Mast TD**, Haworth KJ, Abruzzo TA. Biomedical research at the image-guided ultrasound therapeutics laboratories. J Acoust Soc Am **141**, 3681 (2017).

Hamilton S, Boyce S, Durepos L, Riley MA, **Mast TD**, Walton A, *Mahalingam N*. Intepreting tongue movement on ultrasound. New Horizons: 71st Annual OSLHA Convention, Ohio Speech-Language-Hearing Association, p. 25 (2017).

Hamilton SM, **Mast TD**, Riley M, Boyce S. Articulatory targets for ultrasound biofeedback determined by tracking regional tongue displacements. J Acoust Soc Am **139**, 2222 (2016).

Mast TD, Methods and applications for modeling of continuous-wave ultrasound fields. J Acoust Soc Am **138**, 1882 (2015).

Mast TD, *Fosnight TR*, *Hooi FM*, *Keil RD*, *Subramanian S*, *Nagle AS*, Rao MB, Wang Y, Ren X, Ahmad SA, Barthe PG. Echo decorrelation imaging for quantification of tissue structural changes during ultrasound ablation. J Acoust Soc Am **136**, 2125 (2014).

Fosnight TR, *Hooi FM*, *Colbert SB*, *Keil RD*, **Mast TD**. Estimation of subsurface temperature profiles from infrared measurements during ultrasound ablation. J Acoust Soc Am **136**, 2096 (2014).

Rich KT, **Mast TD**. A method to calibrate the absolute receive sensitivity of spherically focused, single-element transducers. J Acoust Soc Am **136**, 2302 (2014).

Holland CK, **Mast TD**, Haworth KJ, Bader KB, Shekhar H, Radhakrishnan K. Biomedical research at the Image-Guided Ultrasound Therapeutics Laboratories. J Acoust Soc Am **136**, 2199 (2014).

Haworth KJ, *Radhakrishnan K*, **Mast TD**. Frequency-sum passive cavitation imaging. J Acoust Soc Am **135**, 2310 (2014).

Farahani K, Rieke V, Ebbini E, **Mast TD**, Carol M, Burdette C. Image guidance and assessment of therapeutic ultrasound. Medical Physics **40**, 440 (2013).

Subramanian S, *Schmidt DT*, *Fosnight TR*, Rao MB, **Mast TD**, Dependence of ultrasound echo decorrelation on tissue temperature during radiofrequency ablation of *ex vivo* bovine liver. Medical Physics **40**, 451 (2013).

Haworth KJ, *Salgaonkar VA*, *Corregan NM*, Holland CK, **Mast TD**. Spatial specificity and sensitivity of passive cavitation imaging for monitoring high-intensity focused ultrasound thermal ablation in *ex vivo* bovine liver. J Acoust Am **133**, 3263 (2013).

Nagle AS, *Nageswaran AR*, Haridas B, **Mast TD**. Validation of three dimensional strain tracking by volumetric ultrasound image correlation in a pubovisceral muscle model. J Acoust Am **133**, 3358 (2013).

Heath D, Makin IR, Pedapati C, **Mast TD**. Demonstration of bilateral peripheral blood flow response to physical provocation tests including osteopathic digital pressure on vertebral segments. Int J Osteopath Med **16**:e9–e10 (2013).

Rich KT, *Hoerig CL*, **Mast TD**. Cavitation mechanisms in ultrasound-enhanced permeability of *ex vivo* porcine skin. J Acoust Soc Am **132**, 2038 (2012).

Hoerig CL, *Serrone JC*, *Burgess MT*, Zuccarello M, **Mast TD**. Acoustic emissions associated with ultrasound-induced rupture of *ex vivo* blood vessels. J Acoust Soc Am **132**, 2038 (2012).

Haworth KJ, **Mast TD**, *Radhakrishnan K*, Holland CK. Effect of inter-element apodization on passive cavitation images. J Acoust Soc Am **132**, 2038 (2012).

Haworth KJ, **Mast TD**, *Radhakrishnan K*, *Kopechek JA*, *Burgess MT*, Huang S, McPherson DD, Holland CK. Passive cavitation imaging of echogenic liposomes insonified with 6 MHz pulsed Doppler ultrasound in a flow phantom. J Acoust Soc Am **129**, 2513 (2011).

Serrone J, Kocaeli H, **Mast D**, *Burgess M*, Zuccarello M. Potential application of high-intensity focused ultrasound (HIFU) for vascular occlusion in neurosurgery: a review. Program of the 2nd International Symposium on Current and Future Applications of MR-Guided Focused Ultrasound, p. 42 (2010).

Mast TD, *Subramanian SE*. Analytic and numerical modeling of ultrasonic B-scan and echo decorrelation imaging. J Acoust Soc Am **127**, 1826 (2010).

Salgaonkar VA, Holland CK, **Mast TD**. Spatially sensitive passive cavitation detection during ablation with focused ultrasound. Proceedings of 2010 Annual Convention, American Institute of Ultrasound in Medicine, J Ultras Med **29** (2010).

Mast TD, Barthe PG, Makin IRS, Slayton MH, *Karunakaran CP*, *Alqadah AF*, *Burgess MT*, Buell JF, Rudich SM. Treatment of VX2 tumor *in vivo* using miniaturized image-ablate arrays, Proceedings of 2009 Annual Convention, American Institute of Ultrasound in Medicine, J Ultras Med **28**, S29 (2009).

Ammi AY, **Mast TD**, Huang IH, Abruzzo TA, Coussios CC, Shaw GJ, Holland CK. Characterization of ultrasound propagation through ex-vivo human temporal bone. Acoustics08, Joint Meeting of the Acoustical Society of America, 5th Forum Acusticum, and 9th Congrès Français dAcoustique, J Acoust Soc Am **123**, 3632 (2008).

Mast TD, *Pucke DP*, *Subramanian SE*, *Bowlus WJ*, Buell JF. Ultrasonic monitoring of *in vitro* radiofrequency ablation by echo decorrelation imaging. Proceedings of 2008 Annual Convention, American Institute of Ultrasound in Medicine, J Ultras Med **27**, S6 (2008).

Mast TD. Fresnel approximations for acoustic fields of rectangularly symmetric sources. 153rd Meeting, Acoustical Society of America, J Acoust Soc Am **121**, 3151 (2007).

Mast TD, Yu F. Simplified series expansions for radiation from a baffled circular piston. 149th Meeting, Acoustical Society of America, J Acoust Soc Am **117**, 2560 (2005).

Makin IRS, **Mast TD**, Faidi W, Runk MM, Barthe, P. G. and Slayton, MH. Thermal lesion monitoring using miniaturized image-treat arrays. In *Proceedings of the Third International Conference on the Ultrasonic Measurement and Imaging of Tissue Elasticity*, p. 74 (2004).

Slayton MH, Barthe PG, Jaeger PM, Makin IRS, Gallagher LA, **Mast TD**, Faidi W, Runk MM. Dual mode ultrasound therapy/imaging. Annual Meeting, American Association of Physicists in Medicine, Med Phys **31**, 1818 (2004).

Makin IRS, Gallagher LA, **Mast TD**, Runk MM, Faidi W, Barthe PG, and Slayton MH. Interstitial ablation and imaging of soft tissue using miniaturized ultrasound arrays. 147th Meeting, Acoustical Society of America, J Acoust Soc Am **115**, 2849 (2004).

Barthe PG, Slayton MH, Jaeger PM, Makin IRS, Gallagher LA, **Mast TD**, Runk MM, Faidi W. Therapy/imaging array-based system and technology for intense ultrasound surgery. 147th Meeting, Acoustical Society of America, J Acoust Soc Am **115**, 2490 (2004).

Tabei M, **Mast TD**, Waag RC. Comparison of aberration correction methods for transmit and receive focusing in ultrasonic imaging. Ultras Med Biol **29**, S69 (2003).

Tabei M, **Mast TD**, Waag RC. Simulation of ultrasonic focus aberration and correction through human tissue. 143rd Meeting, Acoustical Society of America, J Acoust Soc Am **111**, 2352 (2002).

Mast TD. Aberration-corrected time-domain ultrasound diffraction tomography. 141st Meeting, Acoustical Society of America, J Acoust Soc Am **109**, 2397 (2001).

Mast TD. Time-domain inverse scattering for quantitative ultrasonic mammography. In *Era of Hope: the Department of Defense Breast Cancer Meeting Proceedings*, Vol. 1, p. 224 (2000).

Mast TD, Liu DL, Souriau, LP, Nachman AI, Waag RC. A new k-space method for simulation of ultrasonic propagation in tissue. 138th Meeting, Acoustical Society of America, J Acoust Soc Am **106**, 2135 (1999).

Mast TD. Time-domain ultrasound diffraction tomography. Joint Meeting of Acoustical Society of America, European Acoustics Association, and German Acoustics DAGA, J Acoust Soc Am **105**, 1014 (1999).

Waag RC, **Mast TD**, Nachman AI, Liu DL. Quantitative imaging with eigenfunctions of the scattering operator. Proceedings of 42nd Annual Convention, American Institute of Ultrasound in Medicine, J Ultras Med **17**, S104 (1998).

Mast TD, Swanson DC, Mahon MP, Norris DE. Measurement of multipath outdoor sound propagation with spread-spectrum signals. In *Proceedings of the Eighth International Symposium on Long-Range Sound Propagation* (1998).

Mast TD, Hinkelman LM, Waag RC. Simulation of ultrasonic propagation, scattering, attenuation in the human chest wall. 136th Meeting, Acoustical Society of America, J Acoust Soc Am **104**, 1844 (1998).

Mast TD, Gordon GA. Quantitative flaw reconstruction from ultrasonic surface wave fields measured by laser interferometry. 136th Meeting, Acoustical Society of America, J Acoust Soc Am **104**, 1790 (1998).

Waag RC, Liu DL, **Mast TD**, Nachman AI, Jaeger P, Kojima T. An ultrasonic ring transducer system for studies of scattering and imaging. Proceedings of 41st Annual Convention, American Institute of Ultrasound in Medicine, J Ultras Med **16**, S61 (1997).

Mast TD, Jansson TT, Waag RC. Measurements of differential scattering cross section using a ring transducer. 133rd Meeting, Acoustical Society of America, J Acoust Soc Am **101**, 3139–3140 (1997).

Hinkelman LM, **Mast TD**, Orr MJ, Waag RC. Ultrasonic wavefront distortion caused by human abdominal wall layers. 133rd Meeting, Acoustical Society of America, J Acoust Soc Am **101**, 3140 (1997).

Swanson DC, **Mast TD**, Mahon MP, Norris D. Atmospheric multipath resolution using spread spectrum acoustic signals. 133rd Meeting, Acoustical Society of America, J Acoust Soc Am **101**, 3102 (1997).

Waag RC, Liu DL, **Mast TD**, Nachman AI. Imaging with eigenfunctions of the scattering operator. 133rd Meeting, Acoustical Society of America, J Acoust Soc Am **101**, 3091 (1997).

Mast TD, Hinkelman LM, Sparrow VW, Waag RC. Computations of tissue-induced ultrasound aberration. Proceedings of 40th Annual Convention, American Institute of Ultrasound in Medicine, J Ultras Med **15**, S12 (1996).

Waag RC, Liu DL, **Mast TD**, Nachman AI, Jaeger P, Kojima T. An ultrasonic ring transducer system for studies of scattering and imaging. 132nd Meeting, Acoustical Society of America, J Acoust Soc Am **100**, 2795 (1996).

Waag RC, Liu DL, Hinkelman LM, **Mast TD**. Measurement and correction of ultrasonic wavefront distortion, 132nd Meeting, Acoustical Society of America, J Acoust Soc Am **100**, 2646 (1996).

Mast TD, Nachman AI, Waag RC. Inverse scattering using backpropagated eigenfunctions. 131st Meeting, Acoustical Society of America, J Acoust Soc Am **99**, 2545 (1996).

Mast TD, Hinkelman LM, Waag RC, Sparrow VW. Simulation of ultrasonic propagation through abdominal wall. 129th Meeting, Acoustical Society of America, J Acoust Soc Am **97**, 3325 (1995).

Mast TD, Waag RC. Eigenfunction and eigenvalue analysis of scattering operators. 128th Meeting, Acoustical Society of America, J Acoust Soc Am **96**, 3336 (1995).

Mast TD. Physical theory of narrow-band sounds associated with aneurysms. 127th Meeting, Acoustical Society of America, J Acoust Soc Am **95**, 3672 (1994).

Mast TD, Waag RC. Wavespace resolution in ultrasonic backscatter measurements. 127th Meeting, Acoustical Society of America, J Acoust Soc Am **95**, 2854 (1994).

Mast TD, Waag RC. Design of ultrasonic scattering experiments for tissue characterization. 126th Meeting, Acoustical Society of America, J Acoust Soc Am **94**, 1858 (1993).

Mast TD. Bandwidths and amplitudes of self-excited, flexible-walled cavity resonators. 124th Meeting, Acoustical Society of America, J Acoust Soc Am **92**, 2359 (1992).

Mast TD. A quasi-linear theory of flexible-walled cavity resonators. 123rd Meeting, Acoustical Society of America, J Acoust Soc Am **91**, 2354 (1992).

Mast TD. Excitation of resonators by blood flow in arteries. 121st Meeting, Acoustical Society of America, J Acoust Soc Am **89**, 2007 (1991).

Mast TD. Mechanisms causing narrow-band sounds associated with aneurysms and arterial lesions. 119th Meeting, Acoustical Society of America, J Acoust Soc Am **87**, S140 (1990).

Mast TD, Pierce AD. Extraction of information from low-frequency sounds generated within the human body. 117th Meeting, Acoustical Society of America, J Acoust Soc Am **85**, S151 (1989).

Invited Presentations

Mast TD. Nucleation of a career in biomedical ultrasound. 174th Meeting of the Acoustical Society of America, New Orleans, Louisiana (2017).

Haworth KJ, Bader KB, *Rich KT*, Holland CK, **Mast TD**. Frequency-domain passive cavitation imaging. Acoustics '17 Boston: 173rd Meeting of the Acoustical Society of America and 8th Forum Acusticum, Boston, Massachusetts (2017).

Holland CK, **Mast TD**, Haworth KJ, Abruzzo TA. Biomedical research at the image-guided ultrasound therapeutics laboratories. Acoustics '17 Boston: 173rd Meeting of the Acoustical Society of America and 8th Forum Acusticum, Boston, Massachusetts (2017).

Mast TD, Echo decorrelation imaging for guidance of thermal ablation. Medical Scientist Training Program, University of Cincinnati (2016).

Mast TD, Methods and applications for modeling of continuous-wave ultrasound fields. 170th Meeting of the Acoustical Society of America, Jacksonville, Florida (2015).

Mast TD, *Fosnight TR*, *Hooi FM*, *Keil RD*, *Subramanian S*, *Nagle AS*, Rao MB, Wang Y, Ren X, Ahmad SA, Barthe PG. Echo decorrelation imaging for quantification of tissue structural changes during ultrasound ablation. 168th Meeting of the Acoustical Society of America, Indianapolis, Indiana (2014).

Holland CK, **Mast TD**, Haworth KJ, Bader KB, Shekhar H, Radhakrishnan K. Biomedical research at the Image-Guided Ultrasound Therapeutics Laboratories. 168th Meeting of the Acoustical Society of America, Indianapolis, Indiana (2014).

Mast TD, *Subramanian S*, Rudich SM, *Hooi FM*, *Fosnight TR*, *Nagle AS*, Rao MB, Slayton MH, Barthe PG. Echo decorrelation imaging for guidance of ultrasound ablation. 55th Annual Meeting of the American Association of Physicists in Medicine, Indianapolis, Indiana (2013).

Mast TD, *Subramanian SE*. Analytic and numerical modeling of ultrasonic B-scan and echo decorrelation imaging. 159th Meeting of the Acoustical Society of America, Baltimore, Maryland (2010).

Mast TD. Ultrasound imaging in ablation therapy. 33rd Annual Convention, National Society of Black Engineers, Columbus, Ohio (2007).

Mast TD, Faidi W, Makin IRS. Acoustic field modeling in therapeutic ultrasound. 17th International Symposium on Nonlinear Acoustics, State College, Pennsylvania (2005).

Mast TD, Faidi W, Makin IRS. Acoustic propagation effects in therapeutic ultrasound. 5th International Symposium on Therapeutic Ultrasound, Boston, Massachusetts (2005).

Mast TD. Image-guided intense ultrasound ablation. University of Cincinnati Biomedical Engineering Seminar, Cincinnati, Ohio (2005).

Mast TD. Image-guided ablation using miniaturized ultrasound arrays. Annual University of Cincinnati Biomedical Engineering/Center for Surgical Innovation Seminar, Cincinnati, Ohio (2004).

Makin IRS, **Mast TD**, Faidi W, Runk MM, Barthe, P. G. and Slayton, MH. Thermal lesion monitoring using miniaturized image-treat arrays. Third International Conference on the Ultrasonic Measurement and Imaging of Tissue Elasticity, Lake Windermere, Cumbria, UK (2004).

Mast TD. B-scan imaging and thermal lesion monitoring using miniaturized image-treat ultrasound arrays. Department of Biomedical Engineering Seminar, University of Rochester, Rochester, New York (2004).

Mast TD. B-scan imaging and thermal lesion monitoring using miniaturized image-treat ultrasound arrays. Department of Biomedical Engineering Seminar, Drexel University, Philadelphia, Pennsylvania (2004).

Makin IRS, Gallagher LA, **Mast TD**, Runk MM, Faidi W, Barthe PG, and Slayton MH. Interstitial ablation and imaging of soft tissue using miniaturized ultrasound arrays. 147th Meeting, Acoustical Society of America, New York, New York (2004).

Mast TD. B-scan imaging and thermal lesion monitoring using miniaturized image-treat ultrasound arrays. University of Cincinnati Biomedical Engineering Seminar, Cincinnati, Ohio (2004).

Mast TD. B-scan imaging and thermal lesion monitoring using miniaturized image-treat ultrasound arrays. National Center for Physical Acoustics Seminar, University of Mississippi, Oxford, Mississippi (2004).

Makin IRS, **Mast TD**, Runk MM, Faidi W, Gallagher LA. Miniaturized ultrasound energy-based treatment and imaging devices for interstitial ablation of primary and metastatic liver tumors. Energy Based Therapy at Johnson & Johnson, Princeton, New Jersey (2004).

Mast TD. Inverse scattering for detection of breast cancer and structural flaws. Center for Acoustics and Vibration seminar, University Park, Pennsylvania (2001).

Mast TD. High-resolution quantitative ultrasonic imaging for breast cancer detection. Central Pennsylvania chapter meeting, Institute of Electrical and Electronics Engineers (2001).

Mast TD. Fundamentals of propagation and scattering in inhomogeneous media. Short course for employees of Ford Motor Corp., Penn State Graduate Program in Acoustics, University Park, Pennsylvania (2000).

Waag RC, Liu DL, **Mast TD**, Nachman AI, Jaeger P, Kojima T. An ultrasound ring transducer system for studies of scattering and imaging. 132nd Meeting, Acoustical Society of America, Honolulu, Hawaii (1996).

Waag RC, Liu DL, Hinkelman LM, **Mast TD**. Measurement and correction of ultrasonic wavefront distortion, 132nd Meeting, Acoustical Society of America, Honolulu, Hawaii (1996).

Mast TD. Focusing and imaging with eigenfunctions of the scattering operator. Penn State Graduate Program in Acoustics seminar, University Park, Pennsylvania (1996).