

CURRICULUM VITAE FOR PROMOTION AND TENURE

Edward J. Auerbach
Citizenship: USA

PROFESSIONAL ADDRESS

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IDENTIFYING INFORMATION**Education**

Degree	Institution	Date Degree Granted
B.S.	University of Florida, Gainesville, FL Chemistry	1996
B.A.	University of Florida, Gainesville, FL Criminology & Law	1997
Ph.D. [Co-Advisors: Xiaoping Hu and Kâmil Uğurbil]	University of Minnesota Medical School, Minneapolis, MN Radiology, Biophysical Sciences & Medical Physics	2003
Postdoctoral appointment [Co-Advisors: Kâmil Uğurbil and J. Thomas Vaughan]	University of Minnesota Medical School, Minneapolis, MN Center for Magnetic Resonance Research	2003-2004

Academic Appointments

University of Minnesota Medical School, Twin Cities campus, Department of Radiology (2004-2016)	
Assistant Professor	2015-present
Research Associate	2004-2015

Consulting Positions

Technical Consultant, Stony Brook Foundation, State University of New York, New York, NY	2016-present
Technical Consultant, Life Services LLC, Minneapolis, MN	2012-present
Technical Consultant, MR Instruments, Inc., Minneapolis, MN	2003-2010

Current Membership and Offices in Professional Organizations

International Society for Magnetic Resonance in Medicine 1999-present

Other professional employment

University of Minnesota Medical School, Twin Cities campus, Department of Radiology (1998-2003)
Graduate Research Assistant 1998-2003

University of Florida Medical School, Departments of Radiology and Clinical & Health
Psychology (1997-1998)
Research Assistant 1997-1998

University of Florida, Department of Chemistry (1995-1997)
Research Assistant 1995-1997

HONORS AND AWARDS FOR RESEARCH WORK, TEACHING, PUBLIC ENGAGEMENT, AND SERVICE

External Sources

Poster Award, Functional Neuroimaging, International Society for
Magnetic Resonance in Medicine 2006

Educational Travel Stipend, International Society for Magnetic
Resonance in Medicine 2004

Educational Travel Stipend, International Society for Magnetic
Resonance in Medicine 2002

Educational Travel Stipend, International Society for Magnetic
Resonance in Medicine 2001

RESEARCH AND SCHOLARSHIP

Grants and Contracts

Co-Investigator

Current

Project Title: Advanced Diffusion Imaging of Breast Cancer
External Agency: National Institutes of Health
Principal Investigator(s): Patrick Bolan
Project Dates: 12/1/2015-11/30/2017
Direct Costs: \$150,000

Project Title: Advanced Diffusion Imaging of Breast Cancer
External Agency: United States Department of Defense
Principal Investigator(s): Patrick Bolan
Project Dates: 7/1/2015-6/30/2018
Direct Costs: \$143,933

Project Title: NMR Imaging and Spectroscopy (TRD 1 of 5)
External Agency: National Institutes of Health
Principal Investigator(s): Kâmil Uğurbil
Project Dates: 6/1/2013-5/31/2018
Direct Costs: \$823,183/year

Project Title: NMR Imaging and Spectroscopy (TRD 2 of 5)
External Agency: National Institutes of Health
Principal Investigator(s): Kâmil Uğurbil, Michael Garwood (TRD 2 only)
Project Dates: 6/1/2013-5/31/2018
Direct Costs: \$823,183/year

Project Title: NMR Imaging and Spectroscopy (TRD 3 of 5)
External Agency: National Institutes of Health
Principal Investigator(s): Kâmil Uğurbil, Pierre-Francois Van de Moortele (TRD 3 only)
Project Dates: 6/1/2013-5/31/2018
Direct Costs: \$823,183/year

Project Title: NMR Imaging and Spectroscopy (TRD 4 of 5)
External Agency: National Institutes of Health
Principal Investigator(s): Kâmil Uğurbil, Gregory J. Metzger (TRD 4 only)
Project Dates: 6/1/2013-5/31/2018
Direct Costs: \$823,183/year

Past

Project Title: Knowledge Representation in Neural Systems
External Agency: Intelligence Advanced Research Projects Activity
Principal Investigator(s): Essa Yacoub
Project Dates: 8/1/2013-9/30/2016
Direct Costs: \$716,781

Project Title: Neuroscience Cores for MR Studies of the Brain (Core 2 of 5)
External Agency: National Institutes of Health
Principal Investigator(s): Kâmil Uğurbil, Pierre-Francois Van de Moortele (Core 2)
Project Dates: 9/8/2006-8/31/2012
Total Funding: \$1,656,006 (Core 2 only)

Publications

Peer-Reviewed Publications

Impact factors listed for 2015; citations current as of May 8, 2017.

1. Schmitter S, Moeller S, Wu XP, **Auerbach EJ**, Metzger GJ, Van de Moortele PF, Uğurbil K. Simultaneous multislice imaging in dynamic cardiac MRI at 7T using parallel transmission. *Magn Reson Med*. 2017 Mar;77(3):1010-1020. doi: 10.1002/mrm.26180.
 - Journal Impact Factor: 3.782
 - Citations: n/a
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
2. Casula V, Autio J, Nissi MJ, **Auerbach EJ**, Ellermann J, Lammentausta E, Nieminen MT. Validation and optimization of adiabatic $T_{1\rho}$ and $T_{2\rho}$ for quantitative imaging of articular cartilage at 3 T. *Magn Reson Med*. 2017 Mar;77(3):1265-1275. doi: 10.1002/mrm.26183.
 - Journal Impact Factor: 3.782
 - Citations: n/a
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; reviewed manuscript
3. Erturk MA, Wu XP, Eryaman Y, Van de Moortele PF, **Auerbach EJ**, Lagore RL, DelaBarre L, Vaughan JT, Ugurbil K, Adriany G, Metzger, GJ. Toward imaging the body at 10.5 tesla. *Magn Reson Med*. 2017 Jan;77(1):434-443. doi: 10.1002/mrm.26487.
 - Journal Impact Factor: 3.571
 - Citations: n/a
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
4. Vu AT, Jamison K, Glasser MF, Smith SM, Coalson T, Moeller S, **Auerbach EJ**, Uğurbil K, Yacoub E. Tradeoffs in pushing the spatial resolution of fMRI for the 7T Human Connectome Project. *Neuroimage*. 2016 Nov 25. doi: 10.1016/j.neuroimage.2016.11.049. [Epub ahead of print]
 - Journal Impact Factor: 5.463
 - Citations: n/a
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
5. Glasser MF, Smith SM, Marcus DS, Andersson JLR, **Auerbach EJ**, Behrens TEJ, Coalson TS, Harms MP, Jenkinson M, Moeller S, Robinson EC, Sotiropoulos SN, Xu JQ, Yacoub E, Ugurbil K, Van Essen DC. The Human Connectome Project's neuroimaging approach. *Nature Neuroscience*. 2016 Sep;19(9):1175-87. doi: 10.1038/nn.4361.
 - Journal Impact Factor: 16.724
 - Citations: 13
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
6. Wu X, Schmitter S, **Auerbach EJ**, Uğurbil K, Van de Moortele PF. A generalized slab-wise framework for parallel transmit multiband RF pulse design. *Magn Reson Med*. 2016 Apr;75(4):1444-56. doi: 10.1002/mrm.25689.
 - Journal Impact Factor: 3.782

- Citations: 2
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
7. Todd N, Moeller S, **Auerbach EJ**, Yacoub E, Flandin G, Weiskopf N. Evaluation of 2D multiband EPI imaging for high-resolution, whole-brain, task-based fMRI studies at 3T: Sensitivity and slice leakage artifacts. *Neuroimage*. 2016 Jan 1;124(Pt A):32-42.
 - Journal Impact Factor: 5.463
 - Citations: 7
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
 8. Vu AT, **Auerbach E**, Lenglet C, Moeller S, Sotiropoulos SN, Jbabdi S, Andersson J, Yacoub E, Ugurbil K. High resolution whole brain diffusion imaging at 7T for the Human Connectome Project. *Neuroimage*. 2015 Nov 15;122:318-31.
 - Journal Impact Factor: 5.463
 - Citations: 11
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
 9. Allaïli N, Valabrègue R, **Auerbach EJ**, Guillemot V, Yahia-Cherif L, Bardinet E, Jabourian M, Fossati P, Lehericy S, Marjańska M. Single-voxel (1)H spectroscopy in the human hippocampus at 3 T using the LASER sequence: characterization of neurochemical profile and reproducibility. *NMR Biomed*. 2015 Oct;28(10):1209-17.
 - Journal Impact Factor: 2.983
 - Citations: 1
 - Roles: Contributed to intellectual content; designed and implemented spectroscopy pulse sequences and RF pulses; designed and implemented spectroscopy reconstruction techniques and software; reviewed manuscript
 10. Kochunov P, Jahanshad N, Marcus D, Winkler A, Sprooten E, Nichols TE, Wright SN, Hong LE, Patel B, Behrens T, Jbabdi S, Andersson J, Lenglet C, Yacoub E, Moeller S, **Auerbach E**, Ugurbil K, Sotiropoulos SN, Brouwer RM, Landman B, Lemaître H, den Braber A, Zwiers MP, Ritchie S, van Hulzen K, Almasy L, Curran J, deZubicaray GI, Duggirala R, Fox P, Martin NG, McMahon KL, Mitchell B, Olvera RL, Peterson C, Starr J, Sussmann J, Wardlaw J, Wright M, Boomsma DI, Kahn R, de Geus EJ, Williamson DE, Hariri A, van 't Ent D, Bastin ME, McIntosh A, Deary IJ, Hulshoff Pol HE, Blangero J, Thompson PM, Glahn DC, Van Essen DC. Heritability of fractional anisotropy in human white matter: a comparison of Human Connectome Project and ENIGMA-DTI data. *Neuroimage*. 2015 May 1;111:300-11.
 - Journal Impact Factor: 5.463
 - Citations: 24
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

11. Li X, Wang D, **Auerbach EJ**, Moeller S, Ugurbil K, Metzger GJ. Theoretical and experimental evaluation of multi-band EPI for high-resolution whole brain pCASL Imaging. *Neuroimage*. 2015 Feb 1;106:170-81.
 - Journal Impact Factor: 5.463
 - Citations: 6
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software

12. Griffanti L, Salimi-Khorshidi G, Beckmann CF, **Auerbach EJ**, Douaud G, Sexton CE, Zsoldos E, Ebmeier KP, Filippini N, Mackay CE, Moeller S, Xu J, Yacoub E, Baselli G, Ugurbil K, Miller KL, Smith SM. ICA-based artefact removal and accelerated fMRI acquisition for improved resting state network imaging. *Neuroimage* 2014;95(0):232–247.
 - Journal Impact Factor: 5.463
 - Citations: 96
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

13. Filippini N, Zsoldos E, Haapakoski R, Sexton CE, Mahmood A, Allan CL, Topiwala A, Valkanova V, Brunner EJ, Shipley MJ, **Auerbach EJ**, Moeller S, Ugurbil K, Xu J, Yacoub E, Andersson J, Bijsterbosch J, Clare S, Griffanti L, Hess AT, Jenkinson M, Miller KL, Salimi-Khorshidi G, Sotiropoulos SN, Voets NL, Smith SM, Geddes JR, Singh-Manoux A, Mackay CE, Kivimäki M, Ebmeier KP. Study protocol: The Whitehall II imaging sub-study. *BMC Psychiatry* 2014;14:159.
 - Journal Impact Factor: 2.576
 - Citations: 6
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

14. Schmitter S, Wu X, **Auerbach EJ**, Adriany G, Pfeuffer J, Hamm M, Ugurbil K, Van de Moortele P-F. Seven-tesla time-of-flight angiography using a 16-channel parallel transmit system with power-constrained 3-dimensional spoke radiofrequency pulse design. *Invest Radiol* 2014;49(5):314–325.
 - Journal Impact Factor: 4.887
 - Citations: 9
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging hardware; reviewed manuscript

15. Schmitter S, Wu X, Adriany G, **Auerbach EJ**, Ugurbil K, Van de Moortele P-F. Cerebral TOF angiography at 7T: Impact of B1+ shimming with a 16-channel transceiver array. *Magn Reson Med* 2014;71(3):966–977.
 - Journal Impact Factor: 3.782
 - Citations: 9
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging

16. Wu X, Schmitter S, **Auerbach EJ**, Ugurbil K, Van de Moortele P-F. Mitigating transmit B 1 inhomogeneity in the liver at 7T using multi-spoke parallel transmit RF pulse design. *Quant Imaging Med Surg* 2014;4(1):4–10.
 - Journal Impact Factor: n/a
 - Citations: 4
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging hardware; reviewed manuscript

17. Sotiropoulos SN, Moeller S, Jbabdi S, Xu J, Andersson JL, **Auerbach EJ**, Yacoub E, Feinberg D, Setsompop K, Wald LL, Behrens TEJ, Ugurbil K, Lenglet C. Effects of image reconstruction on fiber orientation mapping from multichannel diffusion MRI: Reducing the noise floor using SENSE. *Magn Reson Med* 2013;70(6):1682–1689.
 - Journal Impact Factor: 3.782
 - Citations: 36
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
 - hardware; reviewed manuscript

18. Xu J, Moeller S, **Auerbach EJ**, Strupp J, Smith SM, Feinberg DA, Yacoub E, Ugurbil K. Evaluation of slice accelerations using multiband echo planar imaging at 3 T. *Neuroimage* 2013;83(0):991–1001.
 - Journal Impact Factor: 5.463
 - Citations: 47
 - Roles: Contributed to intellectual content; co-developed study design; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

19. Schmitter S, Delabarre L, Wu X, Greiser A, Wang D, **Auerbach EJ**, Vaughan JT, Ugurbil K, Van de Moortele P-F. Cardiac imaging at 7 tesla: Single- and two-spoke radiofrequency pulse design with 16-channel parallel excitation. *Magn Reson Med* 2013;70(5):1210–1219.
 - Journal Impact Factor: 3.782
 - Citations: 13
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging hardware; reviewed manuscript

20. Van Essen DC, Smith SM, Barch DM, Behrens TEJ, Yacoub E, Ugurbil K, for the **WU-Minn HCP Consortium**. The WU-Minn Human Connectome Project: An overview. *Neuroimage* 2013;80(0):62–79.
 - Journal Impact Factor: 5.463
 - Citations: 300
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

21. Ugurbil K, Xu J, **Auerbach EJ**, Moeller S, Vu AT, Duarte-Carvajalino JM, Lenglet C, Wu X, Schmitter S, Van de Moortele P-F, Strupp J, Sapiro G, De Martino F, Wang D, Harel N, Garwood M, Chen L, Feinberg DA, Smith SM, Miller KL, Sotiropoulos SN, Jbabdi S, Andersson JLR, Behrens TEJ, Glasser MF, Van Essen DC, Yacoub E, and WU-Minn HCP Consortium. Pushing spatial and temporal resolution for functional and diffusion MRI in the Human Connectome Project. *Neuroimage* 2013;80:80–104.
 - Journal Impact Factor: 5.463
 - Citations: 119
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

22. Sotiropoulos SN, Jbabdi S, Xu J, Andersson JL, Moeller S, **Auerbach EJ**, Glasser MF, Hernandez M, Sapiro G, Jenkinson M, Feinberg DA, Yacoub E, Lenglet C, Van Essen DC, Ugurbil K, Behrens TEJ, and WU-Minn HCP Consortium. Advances in diffusion MRI acquisition and processing in the Human Connectome Project. *Neuroimage* 2013;80:125–143.
 - Journal Impact Factor: 5.463
 - Citations: 139
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

23. Smith SM, Beckmann CF, Andersson J, **Auerbach EJ**, Bijsterbosch J, Douaud G, Duff E, Feinberg DA, Griffanti L, Harms MP, Kelly M, Laumann T, Miller KL, Moeller S, Petersen S, Power J, Salimi-Khorshidi G, Snyder AZ, Vu AT, Woolrich MW, Xu J, Yacoub E, Ugurbil K, Van Essen DC, Glasser MF, and WU-Minn HCP Consortium. Resting-state fMRI in the Human Connectome Project. *Neuroimage* 2013;80:144–168.
 - Journal Impact Factor: 5.463
 - Citations: 147
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

24. Branca RT, Zhang L, Warren WS, **Auerbach EJ**, Khanna A, Degan S, Ugurbil K, Maronpot R. In vivo noninvasive detection of Brown Adipose Tissue through intermolecular zero-quantum MRI. *PLoS ONE* 2013;8(9):e74206.
 - Journal Impact Factor: 3.057
 - Citations: 12
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

25. Wu X, Schmitter S, **Auerbach EJ**, Moeller S, Ugurbil K, Van de Moortele P-F. Simultaneous multislice multiband parallel radiofrequency excitation with independent slice-specific transmit B1 homogenization. *Magn Reson Med* 2013;70(3):630–638.
 - Journal Impact Factor: 3.782
 - Citations: 17
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction

techniques and software; designed, constructed, and installed parallel imaging hardware; reviewed manuscript

26. **Auerbach EJ**, Xu J, Yacoub E, Moeller S, Ugurbil K. Multiband accelerated spin-echo echo planar imaging with reduced peak RF power using time-shifted RF pulses. *Magn Reson Med* 2013;69(5):1261–1267.
 - Journal Impact Factor: 3.782
 - Citations: 31
 - Roles: Corresponding author; guarantor of integrity of study; developed study design; defined intellectual content; contributed to intellectual content; wrote manuscript and responded to reviews; designed and implemented imaging pulse sequences, data processing software, image reconstruction software, RF pulses, and simulations

27. Li C-X, Patel S, **Auerbach EJ**, Zhang X. Dose-dependent effect of isoflurane on regional cerebral blood flow in anesthetized macaque monkeys. *Neurosci Lett* 2013;541:58–62.
 - Journal Impact Factor: 2.107
 - Citations: 24
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences; designed, constructed, and installed continuous ASL imaging hardware; reviewed manuscript

28. Marjańska M, Lehericy S, Valabrègue R, Popa T, Worbe Y, Russo M, **Auerbach EJ**, Grabli D, Bonnet C, Gallea C, Coudert M, Yahia-Cherif L, Vidailhet M, Meunier S. Brain dynamic neurochemical changes in dystonic patients: a magnetic resonance spectroscopy study. *Mov Disord* 2013;28(2):201–209.
 - Journal Impact Factor: 6.01
 - Citations: 13
 - Roles: Contributed to intellectual content; designed and implemented spectroscopy pulse sequences and RF pulses; designed and implemented data processing techniques and software; reviewed manuscript

29. Metzger GJ, **Auerbach EJ**, Akgün C, Simonson J, Bi X, Ugurbil K, Van de Moortele P-F. Dynamically applied B1+ shimming solutions for non-contrast enhanced renal angiography at 7.0 Tesla. *Magn Reson Med* 2013;69(1):114–126.
 - Journal Impact Factor: 3.782
 - Citations: 23
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging and dynamic shimming hardware; reviewed manuscript

30. Muetzel RL, Marjańska M, Collins C, Becker MP, Valabrègue R, **Auerbach EJ**, Lim KO, Luciana M. In vivo 1H magnetic resonance spectroscopy in young-adult daily marijuana users. *Neuroimage Clin* 2013;2(0):581–589.
 - Journal Impact Factor: 3.857
 - Citations: 4
 - Roles: Contributed to intellectual content; designed and implemented spectroscopy pulse sequences and RF pulses; designed and implemented data processing techniques and software; reviewed manuscript

31. Van Essen DC, Ugurbil K, **Auerbach E**, Barch D, Behrens TEJ, Bucholz R, Chang A, Chen L, Corbetta M, Curtiss SW, Penna SD, Feinberg D, Glasser MF, Harel N, Heath AC, Larson-Prior L, Marcus D, Michalareas G, Moeller S, Oostenveld R, Petersen SE, Prior F, Schlaggar BL, Smith SM, Snyder AZ, Xu J, Yacoub E. The Human Connectome Project: A data acquisition perspective. *Neuroimage* 2012;62(4):2222–2231.
 - Journal Impact Factor: 5.463
 - Citations: 216
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

32. Mitsumori F, Watanabe H, Takaya N, Garwood M, **Auerbach EJ**, Michaeli S, Mangia S. Toward understanding transverse relaxation in human brain through its field dependence. *Magn Reson Med* 2012;68(3):947–953.
 - Journal Impact Factor: 3.782
 - Citations: 10
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; acquired data at 3T and 7T; reviewed manuscript

33. Schmitter S, Bock M, Johst S, **Auerbach EJ**, Ugurbil K, Van de Moortele P-F. Contrast enhancement in TOF cerebral angiography at 7 T using saturation and MT pulses under SAR constraints: Impact of VERSE and sparse pulses. *Magn Reson Med* 2012;68(1):188–197.
 - Journal Impact Factor: 3.782
 - Citations: 16
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging hardware; reviewed manuscript

34. Smith SM, Miller KL, Moeller S, Xu J, **Auerbach EJ**, Woolrich MW, Beckmann CF, Jenkinson M, Andersson J, Glasser MF, Van Essen DC, Feinberg DA, Yacoub ES, Ugurbil K. Temporally-independent functional modes of spontaneous brain activity. *P Natl Acad Sci USA* 2012;109(8):3131–3136.
 - Journal Impact Factor: 9.423
 - Citations: 262
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript

35. Marjańska M, **Auerbach EJ**, Valabrègue R, Van de Moortele P-F, Adriany G, Garwood M. Localized ¹H NMR spectroscopy in different regions of human brain in vivo at 7 T: T2 relaxation times and concentrations of cerebral metabolites. *NMR Biomed* 2012;25(2):332–339.
 - Journal Impact Factor: 2.983
 - Citations: 33
 - Roles: Contributed to intellectual content; designed and implemented spectroscopy pulse sequences and RF pulses; designed and implemented data processing techniques and software; reviewed manuscript

36. Park J-Y, Moeller S, Goerke U, **Auerbach EJ**, Chamberlain R, Ellermann J, Garwood M. Short echo-time 3D radial gradient-echo MRI using concurrent dephasing and excitation. *Magn Reson Med* 2012;67(2):428–436.
- Journal Impact Factor: 3.782
 - Citations: 4
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences, acquisition strategies, and RF pulses; reviewed manuscript
37. Emir UE, **Auerbach EJ**, Moortele P-FVD, Marjańska M, Ugurbil K, Terpstra M, Tkac I, Oz G. Regional neurochemical profiles in the human brain measured by 1H MRS at 7 T using local B1 shimming. *NMR Biomed* 2012;25(1):152–160.
- Journal Impact Factor: 2.983
 - Citations: 36
 - Roles: Contributed to intellectual content; designed and implemented spectroscopy pulse sequences and RF pulses; designed and implemented data processing techniques and software; reviewed manuscript
38. Feinberg DA, Moeller S, Smith SM, **Auerbach EJ**, Ramanna S, Glasser MF, Miller KL, Ugurbil K, Yacoub E. Multiplexed echo planar imaging for sub-second whole brain fMRI and fast diffusion imaging. *PLoS ONE* 2010;5(12):e15710.
- Journal Impact Factor: 3.057
 - Citations: 316
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
39. Adriany G, **Auerbach EJ**, Snyder CJ, Gozubüyük A, Moeller S, Ritter J, Van de Moortele P-F, Vaughan JT, Ugurbil K. A 32-channel lattice transmission line array for parallel transmit and receive MRI at 7 tesla. *Magn Reson Med* 2010;63(6):1478–1485.
- Journal Impact Factor: 3.782
 - Citations: 24
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; acquired data at 7T; designed, constructed, and installed parallel imaging hardware and 32-channel transmit hardware; edited and reviewed manuscript
40. Moeller S, Yacoub E, Olman CA, **Auerbach EJ**, Strupp J, Harel N, Ugurbil K. Multiband multislice GE-EPI at 7 tesla, with 16-fold acceleration using partial parallel imaging with application to high spatial and temporal whole-brain fMRI. *Magn Reson Med* 2010;63(5):1144–1153.
- Journal Impact Factor: 3.782
 - Citations: 268
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; reviewed manuscript
41. Pohmann R, Budde J, **Auerbach EJ**, Adriany G, Ugurbil K. Theoretical and experimental evaluation of continuous arterial spin labeling techniques. *Magn Reson Med* 2010;63(2):438–446.
- Journal Impact Factor: 3.782

- Citations: 12
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences; designed, constructed, and installed continuous ASL imaging hardware; reviewed manuscript
42. Van de Moortele P-F, **Auerbach EJ**, Olman C, Yacoub E, Ugurbil K, Moeller S. T1 weighted brain images at 7 Tesla unbiased for Proton Density, T2* contrast and RF coil receive B1 sensitivity with simultaneous vessel visualization. *Neuroimage* 2009;46(2):432–446.
- Journal Impact Factor: 5.463
 - Citations: 100
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging hardware; reviewed manuscript
43. Adriany G, Van de Moortele P-F, Ritter J, Moeller S, **Auerbach EJ**, Akgün C, Snyder CJ, Vaughan JT, Ugurbil K. A geometrically adjustable 16-channel transmit/receive transmission line array for improved RF efficiency and parallel imaging performance at 7 Tesla. *Magn Reson Med* 2008;59(3):590–597.
- Journal Impact Factor: 3.782
 - Citations: 93
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; designed and implemented image reconstruction techniques and software; designed, constructed, and installed parallel imaging hardware; edited and reviewed manuscript
44. Zhang X, Nagaoka T, **Auerbach EJ**, Champion R, Zhou L, Hu X, Duong TQ. Quantitative basal CBF and CBF fMRI of rhesus monkeys using three-coil continuous arterial spin labeling. *Neuroimage* 2007;34(3):1074–1083.
- Journal Impact Factor: 5.463
 - Citations: 18
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences; designed, constructed, and installed continuous ASL imaging hardware; reviewed manuscript
45. Carey JR, Greer KR, Grunewald TK, Steele JL, Wiemiller JW, Bhatt E, Nagpal A, Lungu O, **Auerbach EJ**. Primary motor area activation during precision-demanding versus simple finger movement. *Neurorehabil Neural Repair* 2006;20(3):361–370.
- Journal Impact Factor: 4.035
 - Citations: 21
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; acquired and processed imaging data; designed and implemented image reconstruction techniques and software; reviewed manuscript
46. Gourtzelidis P, Tzagarakis C, Lewis SM, Crowe DA, **Auerbach EJ**, Jerde TA, Ugurbil K, Georgopoulos AP. Mental maze solving: directional fMRI tuning and population coding in the superior parietal lobule. *Exp Brain Res* 2005;165(3):273–282.
- Journal Impact Factor: 2.057
 - Citations: 17

- Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; acquired and processed imaging data; designed and implemented image reconstruction techniques and software; reviewed manuscript
47. Carey JR, Anderson KM, Kimberley TJ, Lewis SM, **Auerbach EJ**, Ugurbil K. fMRI analysis of ankle movement tracking training in subject with stroke. *Exp Brain Res* 2004;154(3):281–290.
- Journal Impact Factor: 2.057
 - Citations: 40
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; acquired and processed imaging data; designed and implemented image reconstruction techniques and software; reviewed manuscript
48. Kimberley TJ, Lewis SM, **Auerbach EJ**, Dorsey LL, Lojovich JM, Carey JR. Electrical stimulation driving functional improvements and cortical changes in subjects with stroke. *Exp Brain Res* 2004;154(4):450–460.
- Journal Impact Factor: 2.057
 - Citations: 158
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; acquired and processed imaging data; designed and implemented image reconstruction techniques and software; reviewed manuscript
49. Crosson B, Benefield H, Cato MA, Sadek JR, Moore AB, Wierenga CE, Gopinath K, Soltysik D, Bauer RM, **Auerbach EJ**, Gökçay D, Leonard CM, Briggs RW. Left and right basal ganglia and frontal activity during language generation: contributions to lexical, semantic, and phonological processes. *J Int Neuropsychol Soc* 2003;9(7):1061–1077.
- Journal Impact Factor: 2.633
 - Citations: 100
 - Roles: Contributed to intellectual content; designed and implemented imaging protocols; acquired and processed imaging data; designed and implemented image processing techniques and software; reviewed manuscript
50. Crosson B, Cato MA, Sadek JR, Gökçay D, Bauer RM, Fischler IS, Maron L, Gopinath K, **Auerbach EJ**, Browd SR, Briggs RW. Semantic monitoring of words with emotional connotation during fMRI: contribution of anterior left frontal cortex. *J Int Neuropsychol Soc* 2002;8(5):607–622.
- Journal Impact Factor: 2.633
 - Citations: 26
 - Roles: Contributed to intellectual content; designed and implemented imaging protocols; acquired and processed imaging data; designed and implemented image processing techniques and software; reviewed manuscript
51. Carey JR, Kimberley TJ, Lewis SM, **Auerbach EJ**, Dorsey LL, Rundquist P, Ugurbil KA. Analysis of fMRI and finger tracking training in subjects with chronic stroke. *Brain* 2002;125(4):773–788.
- Journal Impact Factor: 10.103
 - Citations: 330
 - Roles: Contributed to intellectual content; designed and implemented imaging pulse sequences and RF pulses; acquired and processed imaging data; designed and implemented image reconstruction techniques and software; reviewed manuscript

52. Crosson B, Sadek JR, Maron L, Gokçay D, Mohr CM, **Auerbach EJ**, Freeman AJ, Leonard CM, Briggs RW. Relative shift in activity from medial to lateral frontal cortex during internally versus externally guided word generation. *J Cogn Neurosci* 2001;13(2):272–283.
- Journal Impact Factor: 3.559
 - Citations: 98
 - Roles: Contributed to intellectual content; designed and implemented imaging protocols; acquired and processed imaging data; designed and implemented image processing techniques and software; reviewed manuscript
53. Crosson B, Radonovich K, Sadek JR, Gokçay D, Bauer RM, Fischler IS, Cato MA, Maron L, **Auerbach EJ**, Browd SR, Briggs RW. Left-hemisphere processing of emotional connotation during word generation. *Neuroreport* 1999;10(12):2449–2455.
- Journal Impact Factor: 1.343
 - Citations: 39
 - Roles: Contributed to intellectual content; designed and implemented imaging protocols; acquired and processed imaging data; designed and implemented image processing techniques and software; reviewed manuscript
54. Crosson B, Sadek JR, Bobholz JA, Gökçay D, Mohr CM, Leonard CM, Maron L, **Auerbach EJ**, Browd SR, Freeman AJ, Briggs RW. Activity in the Paracingulate and Cingulate Sulci during Word Generation: An fMRI Study of Functional Anatomy. *Cerebral Cortex* 1999;9(4):307–316.
- Journal Impact Factor: 8.285
 - Citations: 88
 - Roles: Contributed to intellectual content; designed and implemented imaging protocols; acquired and processed imaging data; designed and implemented image processing techniques and software; reviewed manuscript
55. Szczepanski J, **Auerbach EJ**, Vala M. C₆⁻ Carbon Cluster Anion: An Infrared Absorption and Resonance Raman Isotopic Study. *The Journal of Physical Chemistry A* 1997;101(49):9296–9301.
- Journal Impact Factor: 2.883
 - Citations: 18
 - Roles: Contributed to intellectual content; conducted simulations of spectra using various theoretical models; reviewed manuscript

Software Development

Multi-band accelerated EPI pulse sequences for Siemens scanners (BOLD, SE, diffusion variants). This software has been made available for 12 scanner platforms and is distributed free of charge to collaborating institutions:

1. RWTH Aachen University Clinic, Aachen, Germany
2. University of Edinburgh, Edinburgh, Scotland, GB
3. ADMI, Geisinger Health System, Lewisburg, PA
4. Glendale Adventist Medical Center, Glendale, California
5. Princess Alexandra Hospital, Brisbane, Australia
6. IRMf Center, Marseille, France
7. Antwerp University Hospital, Antwerp, Belgium

8. Arcadia MRI & Imaging Center, California
9. University of Arizona
10. ATR-Promotions, Kyoto, Japan
11. Auburn University
12. Center for Advanced MRI, University of Auckland, New Zealand
13. FMHS, University of Auckland, New Zealand
14. BCBL, San Sebastián, Spain
15. Bernstein Center for Computational Neuroscience, Berlin
16. Baylor College of Medicine, Houston, TX
17. UC Berkeley
18. Beijing Huilongguan Hospital, Beijing, China
19. Bilkent University
20. Beijing Tiantan Hospital, Capital Medical University, Beijing, China
21. Bordeaux University, Bordeaux, France
22. VA Boston Healthcare System
23. Boys Town National Research Hospital, Omaha, Nebraska
24. The Florey Institute of Neuroscience and Mental Health, Melbourne Brain Centre, Heidelberg, Victoria, Australia
25. Brigham And Women's Hospital, Harvard
26. University of Bristol, UK
27. Brown University
28. University of Sussex, Brighton UK
29. BUCNI, London, UK
30. Brigham Young University MRI Research Facility, UT
31. Caltech
32. Wolfson Brain Imaging Centre, University of Cambridge, Cambridge, England
33. CUBRIC, Cardiff University, Great Britain
34. The Cleveland Clinic Lou Ruvo Center for Brain Health, Cleveland, OH
35. The Cleveland Clinic, Cleveland, OH
36. Cermep, Lyon, France
37. CFIN AARHUS UNIVERSITY HOSPITAL, Aarhus, Denmark
38. Center for Stroke Research, Charite Universitaetsmedizin, Berlin, Germany
39. Child Mind Institute, New York
40. Children's Hospital of Philadelphia, University of PA
41. Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland
42. Centro Integral de Neurociencias AC (CINAC), Mostoles, Madrid, Spain
43. A*STAR-NUS Clinical Imaging Research Centre (CIRC), Singapore
44. CITA Alzheimer Foundation, San Sebastián, Spain
45. National Research Council, CNR-URT Campus Universitario, Catanzaro, Italy
46. Weill Cornell Medical College, New York, NY
47. Center for Magnetic Resonance in Biology and Medicine, Marseille, France
48. Cedars-Sinai Medical Center, Los Angeles, CA
49. Dokkyo Medical University, Shimotsuga-gun, Tochigi, Japan
50. Donders
51. Deutsches Primatenzentrum, Goettingen, Lower-Saxony, Germany
52. Copenhagen University Hospital, Denmark
53. TU Dresden, Germany
54. Duke-National University of Singapore Medical School, Singapore
55. Durham University, Durham, UK
56. DZNE German Center for Neurodegenerative Disease, Bonn, Germany
57. Ebara Hospital, Tokyo, Japan

58. Center for Evolutionary Cognitive Sciences, University of Tokyo, Tokyo, Japan
59. Albert Einstein, Brazil
60. The Hebrew University of Jerusalem, Israel
61. Emory, Atlanta, Georgia
62. Universitätsklinikum Erlangen, Germany
63. Fukushima Medical University, Fukushima, Japan
64. Guang'anmen Hospital, China Academy of Chinese Medical Sciences, Beijing, China
65. Center for Advanced Brain Imaging, Georgia Tech, Atlanta, GA
66. Ghent University, Ghent, Belgium
67. University of Glasgow
68. University of Greifswald, Germany
69. Griffith University, Southport, QLD, Australia
70. Otto-von-Guericke University
71. Göttingen University Medical Center
72. University Medical Center Hamburg-Eppendorf, Germany
73. Boston Children's Hospital, Boston, MA
74. Harvard College
75. University of Hawaii
76. HCFMUSP, Sao Paulo, Brazil
77. University of Heidelberg
78. Hiroshima University
79. Huaxi MR Research Center, West China Hospital, Sichuan University, Chengdu, China
80. Hokkaido University, Sapporo, Japan
81. Nemocnice Na Homolce, Prague
82. Melbourne Health, Department of Radiology Parkville, VIC Australia
83. University Hospital of Geneva (HUG), Geneva, Switzerland
84. Medical Imaging Center, Helsinki University Hospital, Helsinki, Finland
85. Institute of Biophysics, Chinese Academy of Sciences, Beijing, China
86. Instituto de Fisiologia Celular UNAM, Mexico
87. Imperial College London
88. Indiana University
89. INFN, University of Rome Sapienza, Rome, Italy
90. Bern University Hospital
91. Chinese Academy of Sciences, Shanghai, China
92. Institute for Research in IT and Random Systems, Rennes, Brittany, France
93. Thomas Jefferson University, Philadelphia, PA
94. Jena University Hospital, Jena, Thuringa, Germany
95. Johns Hopkins University, Baltimore, Maryland
96. Johns Hopkins University School of Medicine, Baltimore, Maryland
97. Juntendo University School of Medicine, Tokyo, Japan
98. Carnegie Mellon University
99. King's College, London, UK
100. Kanagawa Children's Medical Center, Yokohama-city, Kanagawa, JP
101. King Khaled University Hospital, King Saud University, Riyadh, Saudi Arabia
102. Kochi Univ of Technology, Japan
103. Kokoro Research Center, Kyoto University, Japan
104. Kyoto Prefectural University of Medicine, Kyoto, Japan
105. Cantonal Hospital of St.Gallen Department for Neurology, St.Gallen, St.Gallen, CH
106. Kumamoto University, Kumamoto, Japan
107. Hogle Brain Imaging Center, KU Medical Center, Kansas City, Kansas

108. Akademika Kurchatova, Moscow, Russia
109. Kyoto University Graduate School of Medicine
110. Lawson Health Research Institute, London, ON, Canada
111. University Hospital Leipzig, Germany
112. Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
113. Institut universitaire de gériatrie de Montréal, CA
114. University of Southern California, CA
115. University of Louisville, Louisville, KY
116. Maastricht
117. University Medical Center Mainz, Germany
118. Central Institute of Mental Health, Mannheim, Germany
119. McConnell Brain Imaging Centre, McGill University, Quebec
120. McLean Imaging Center
121. Murdoch Children's Research Institute, Victoria, Australia
122. University of Marburg, Marburg, Hesse, DE
123. Meiji University of Integrative Medicine, Kyoto, Japan
124. Fraunhofer MEVIS, Bremen, Germany
125. MGH Martinos Center for Biomedical Imaging, Boston MA
126. VA Boston Healthcare System, Boston, MA
127. Massachusetts General Hospital, Charlestown, MA
128. The Mind Research Network, Albuquerque, NM
129. Massachusetts Institute of Technology, Cambridge, Massachusetts
130. Monash Biomedical Imaging, Clayton, Victoria, Australia
131. Max Planck Institute for Metabolism Research, Cologne, Germany
132. Max Planck Institute for Human Development, Berlin, Germany
133. Macquarie Medical Imaging, Macquarie University Hospital, Sydney, Australia
134. MRC Cognition and Brain Sciences Unit, Cambridge University, Cambridge, UK
135. Icahn School of Medicine, Mount Sinai, New York
136. Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary
137. Institute for Clinical Radiology, Munich, Germany
138. Masaryk University, Central European Institute of Technology - CEITEC, Brno, Czech Republic
139. Department of Radiology, Nagoya City University Graduate School of Medical Sciences, Nagoya, Aichi, Japan
140. Nara Medical University, Kashihara, Japan
141. Nationwide Children's Hospital, Columbus, Ohio
142. National Center of Neurology and Psychiatry, Kodaira, Tokyo, Japan
143. University of Oxford, Great Britain
144. Neurospin, Gif-sur-Yvette, France
145. University of Newcastle
146. NiCT, Osaka, Japan
147. Functional MRI Facility/NIMH/NIH, Bethesda MD
148. National Institute for Physiological Sciences, Okazaki, Japan
149. Nathan Kline Institute, Orangeburg, NY
150. North Shore University Hospital, Manhasset, NY
151. Norwegian University of Science and Technology (NTNU)
152. National Taiwan University, Taipei, Taiwan
153. National Taiwan University College of Medicine, Taipei, Taiwan
154. NUDZ (Czech National Institute of Mental Health), Klecany, Czech Republic
155. National University of Singapore, Singapore

156. Northwestern University
157. National Yang Ming University, Taiwan
158. New York University School of Medicine
159. Oregon Health & Science University, Portland, Oregon
160. Ohio State University
161. Dunedin, Otago, New Zealand
162. The Royal Ottawa Hospital, Ottawa, Canada
163. Oulu University, Finland
164. Neurological University Clinic Magdeburg, Germany
165. Oxford University
166. University of Pittsburgh
167. Peking University, Beijing, China
168. Neuroscience Institute, Christian Doppler Klinik, Paracelsus Medical University, Salzburg, Austria
169. Poitiers University Hospital, Poitiers, France
170. University Hospital St. Pölten, St. Pölten, Austria
171. Pacific Radiology Group
172. Princeton University, Princeton, NJ
173. Penn State College of Medicine
174. SLEIC, Penn State University, State College, PA
175. Physikalisch-Technische Bundesanstalt, Berlin, Germany
176. Purdue University, West Lafayette, IN
177. QIMR Berghofer Medical Research Institute
178. National Institute of Radiological Sciences, Chiba, Japan
179. Queen's University, Centre for Neuroscience Studies, Ontario, CA
180. Psychology Department, University of Reading, UK
181. Research institute of National Rehabilitation Center for Persons with Disabilities, Tokorozawa-city, Saitama-prefecture, Japan
182. Rigshospitalet, Copenhagen, Denmark
183. Riken Brain Science Institute, Wako-shi, Japan
184. Riken, Japan
185. The Royal Melbourne Hospital, Australia
186. University of Western Ontario Robarts Research Institute
187. University of Roehampton, London
188. Diagnostical and Interventional Radiology of University Hospital, Rostock Germany
189. RUBIC, Rutgers University, NJ
190. Rush University Medical Center, Chicago, IL
191. Seattle Children's Hospital, Washington
192. Brain Image Center of South China Normal University, Guangzhou, China
193. IRCCS SDN, Naples, Italy
194. Seoul National University, South Korea
195. Showa University Karasuyama Hospital, Setagaya-ku, Tokyo, Japan
196. The Hospital for Sick Children, Toronto, Canada
197. Siemens Korea, Seoul, South Korea
198. Skane University Hospital, Lund, Sweden
199. Shanghai Key Laboratory of Magnetic Resonance, Department of Physics, East China Normal University
200. Saint Louis University School of Medicine, St. Louis, MO
201. Shanghai Mental Health Center, China
202. Shandong Medical Imaging Research Institute, Jinan, Shandong, China
203. Southwest University, Chongqing, China

204. Sunnybrook Research Institute, Toronto, Canada
205. University Research Clinic for Innovative Patient Pathways, Silkeborg, Jylland, Denmark
206. St. Jude Children's Research Hospital, Memphis, TN
207. Stony Brook University, New York
208. Strauss Center for Computational Neuroimaging, Tel Aviv University, Tel Aviv, Israel
209. Swinburne University Australia
210. Taipei Medical University Hospital, Taipei, Taiwan
211. Texas A&M University, College Station, Texas
212. Tianjin First Central Hospital, TianJin, CN
213. Tohoku Fukushi University, Sendai, Miyagi, Japan
214. Radiology Department, Beijing Tiantan hospital, Beijing, China
215. Texas Tech University
216. Max Planck Institute for Biological Cybernetics, Germany
217. TU Graz, IMT, Graz, Austria
218. The University Hospital, Technische Universitat Munchen, Germany
219. University of Alabama at Birmingham
220. University of Alberta, Edmonton, Alberta, Canada
221. School of Medicine, University of Buenos Aires, Buenos Aires, Argentina
222. Hospital Clinic of Barcelona / Univerisity of Barcelona, Spain
223. UC Davis
224. VA Medical Center at Martinez, Martinez, CA
225. UCL Institute of Neurology, London
226. UCL Institute of Child Health
227. Staglin IMHRO Center for Cognitive Neuroscience
228. Ahmanson-Lovelace Brain Mapping Center, UCLA, Los Angeles, CA
229. WTCN, University College London
230. University of Connecticut, Storrs, CT
231. Department of Psychological & Brain Sciences, UCSB, Santa Barbara, CA
232. San Francisco VA Medical Center, San Francisco, CA
233. University of California, San Francisco, CA
234. University of Delaware, Delaware
235. University of Florida College of Medicine, Gainesville, FL
236. University Hospital Basel, Basel, Switzerland
237. University of Illinois
238. University of Oslo, Oslo, Norway
239. University of Iowa
240. UK Biobank, Stockport, UK
241. University of Regensburg, Regensburg, Germany
242. Cyclotron Research Centre, University of Liege, Liege, Belgium
243. University of Manitoba Faculty of Medicine, Winnipeg, Manitoba, Canada
244. University of Maryland School of Medicine and Maryland Psychiatric Research Center, Catonsville, MD
245. Neuroimaging Center, University Medical Center Groningen, Groningen, Netherlands
246. University of Mississippi Medical Center
247. Maryland Neuroimaging Center, University of Maryland
248. The University of Tokyo Hospital, Medical Information Network, Tokyo, Japan
249. Instituto Nacional de Neurologia y Neurocirugia, Mexico City, Mexico
250. University of North Carolina at Chapel Hill
251. University of Geneva
252. Medical University of Graz, Austria

253. University of Padova, Padova, Italy
254. University of Salerno, Baronissi (Salerno), Italy
255. ICube Laboratory, University of Strasbourg, France
256. Medical University of Vienna
257. University of Nebraska, Lincoln NE
258. University of Oregon
259. Treatment Research Center, University of Pennsylvania
260. University Pierre et Marie Curie
261. University of Southern California
262. University of South Carolina
263. University Hospital Zurich, Switzerland
264. University of Utah
265. UT-Austin
266. James J. Peters VA Medical Center, Mental Health Patient Care Center, Bronx, New York
267. University of Virginia
268. Virginia Tech, Roanoke, Virginia
269. Wake Forest University of Health Sciences
270. Wayne State School of Medicine, Michigan
271. Wayne State University, Michigan
272. The Weizmann Institute of Science, Israel
273. Washington University
274. Xuanwu Hospital, Capital Medical University, Beijing, China
275. National Institute of Mental Health and Neurosciences, Bangalore, karnataka, IN
276. Olin Neuropsychiatry Research Center Institute of Living, Hartford CT
277. Yale
278. National Institute on Drug Abuse (NIDA), NIH, Bethesda, MD
279. San Antonio, TX
280. School of Medicine University of Zagreb, Croatia
281. Zhongda Hospital, Nanjing, Jiangsu, China
282. Zhejiang University, China

Localized shimming (FASTMAP), Magnetic Resonance Spectroscopy (MRS), and Chemical Shift Imaging (CSI) pulse sequences for Siemens scanners (LASER, SEMI-LASER, PRESS, MEGA-PRESS, MEGA-SEMI-LASER, STEAM variants). This software has been made available for 11 scanner platforms and is distributed free of charge to collaborating institutions:

1. RWTH Aachen University Clinic, Germany
2. Aix-Marseille University, Marseille, FR
3. Aston University, Birmingham, GB
4. ATR-Promotions Inc., Seikacho, Sorakugun, Kyoto, Japan
5. Auburn University, Auburn, AL, US
6. Baycrest, Toronto, Ontario Canada
7. Baylor College of Medicine, Houston, TX
8. University of California, Berkeley, CA
9. University of Bristol, GB
10. Wolfson Brain Imaging Centre, University of Cambridge, Cambridge, England
11. Cambridge University
12. Cleveland Clinic, Cleveland, OH
13. Commissariat a' l'Energie Atomique France

14. Masaryk University, Central European Institute of Technology - CEITEC, Czech Republic
15. Children's Hospital of Philadelphia, Philadelphia, PA
16. Weill Cornell Medical College, New York, NY
17. Duke University Medical Center, Durham, NC
18. Hospital Israelita Albert Einstein, Sao Paulo, Brazil
19. Emory University, Atlanta, GA
20. University Clinic of Friedrich
21. Fairview Health System, Minneapolis, MN, US
22. Florida International University, Miami, Florida
23. Fukushima Medical University, Japan
24. Georgia State University
25. Hannover Medical School, Hannover, Germany
26. University Hospital Heidelberg
27. Hartford Hospital, Hartford, CT
28. Hokkaido University, Sapporo, Japan
29. Huashan Hospital, Fudan University
30. ICM Institut du Cerveau et de la Moelle epiniere
31. Imanova, London, GB
32. Imperial College, London, England
33. Indiana University
34. INFN, University of Rome Sapienza, Italy
35. University Bern, Bern, Switzerland
36. Institute of Neuroscience, Chinese Academy of Sciences, Shanghai, China
37. Korea Advanced Institute of Science and Technology, Daejeon, Korea
38. University of Kansas Medical Center
39. Kyoto University Graduate School of Informatics, Japan
40. Linkoping University, Linkoping, Sweden
41. Lund University Department of Diagnostic Radiology, Lund, Skåne, SE
42. Cermep - Imagerie du vivant
43. McKnight Brain Institute, Gainesville, Florida
44. McGill University
45. McLean Hospital Brain Imaging Center, Belmont, MA
46. The McLean Hospital Corporation
47. Meiji University of Integrative Medicine, Japan
48. Merck & Co, Whitehouse Station, NJ
49. Massachusetts General Hospital, Charlestown, MA
50. Mind Research Network
51. Montreal Neurological Institute
52. Max Planck Institute for Human Development, Berlin, Germany
53. Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
54. University of Maryland School of Medicine, Baltimore, Maryland
55. MRC Cognition and Brain Sciences Unit, Cambridge University
56. Klinikum der Universitaet Muenchen, Munich, Germany
57. MUSC, Charleston, SC, US
58. Association Institut de Myologie
59. National Center of Neurology and Psychiatry, Kodaira-city, Tokyo, Japan
60. National Institute of Information and Communications, Osaka, Japan
61. National Institute of Neurological Disorders and Stroke, Bethesda, MD
62. National Institute for Physiological Sciences, Okazaki, Aichi, Japan
63. National Institute of Radiological Sciences, Chiba, Japan

64. North Shore University Hospital, Manhasset, NY
65. Department of Neurosurgery, Oita University, Yufu City, Oita, Japan
66. University of Western Ontario
67. Dunedin, Otago, New Zealand
68. Centre Hospitalier Universitaire de Poitiers
69. University Hospital St. Pölten, St. Pölten, Austria
70. Polytechnique Montreal, Montreal, Quebec, Canada
71. Penn State University, SLEIC
72. Purdue University, West Lafayette, Indiana
73. Tokorozawa-city, Saitama-prefecture, Japan
74. University of Rome "La Sapienza"
75. Icahn School of Medicine at Mount Sinai
76. Swansea University, Swansea, England
77. University of Sydney
78. The Royal Ottawa Hospital, Ottawa, Ontario, Canada
79. Showa University Karasuyama Hospital, Setagaya-ku, Tokyo, Japan
80. TU Graz, IMT, Graz, Austria
81. University of Alabama at Birmingham
82. UC Davis Imaging Research Center
83. UCLA Semel Institute for Neuroscience and Human Behavior, Los Angeles, California
84. University of Florida College of Medicine
85. University of Wuerzburg, Germany
86. Instituto Nacional de Neurologia y Neurocirugia, Mexico City, Mexico
87. Medical University of Vienna
88. University of Pennsylvania, Philadelphia, Pennsylvania
89. University Pierre et Marie Curie
90. Centro Integral de Neurociencias AC (CINAC), Madrid, Spain
91. University of Utah School of Medicine, Salt Lake City, Utah
92. The University of Tokyo, Tokyo, Japan
93. UCSF/VASF
94. Wayne State University
95. The Weizmann Institute of Science, Rehovot, Israel
96. Winnipeg Health Sciences Centre, Winnipeg, Canada

GPU-accelerated remote multi-band image reconstruction. This software is distributed to allow collaborators who have older Siemens MRI scanners with slower reconstruction hardware to have the capability to acquire and reconstruct images in real time. It is distributed free of charge to collaborating institutions:

1. Nathan Kline Institute, Orangeburg, NY
2. Washington University
3. Oxford University
4. McLean Imaging Center
5. Neurospin, Gif-sur-Yvette, France
6. Maastricht University
7. Massachusetts Institute of Technology
8. Institute of Biophysics, Chinese Academy of Sciences, Beijing, China
9. Yale University
10. Olin Neuropsychiatry Research Center Institute of Living, Hartford CT
11. University of Utah
12. TU Dresden, Germany

13. Treatment Research Center, University of Pennsylvania
14. University Pierre et Marie Curie
15. MIND Research Institute
16. National Yang Ming University, Taiwan
17. Bernstein Center for Computational Neuroscience, Berlin
18. Staglin IMHRO Center for Cognitive Neuroscience, UCLA
19. Brigham Young University MRI Research Facility, UT
20. Psychology Department, University of Reading, UK
21. Ahmanson-Lovelace Brain Mapping Center, UCLA
22. Maryland Neuroimaging Center, University of Maryland
23. RUBIC, Rutgers University, NJ
24. Shanghai Key Laboratory of Magnetic Resonance, East China Normal University
25. National Institute for Physiological Sciences, Okazaki, Japan
26. ICube Laboratory, University of Strasbourg, France
27. University of Maryland School of Medicine and Maryland Psychiatric Research Center, Catonsville, MD
28. Arcadia MRI & Imaging Center, California
29. Glendale Adventist Medical Center, Glendale, California
30. University of Texas at Austin
31. Weill Cornell Medical College, New York, NY
32. Functional MRI Facility/NIMH/NIH, Bethesda MD
33. NiCT, Osaka, Japan
34. ATR-Promotions, Kyoto, Japan
35. Child Mind Institute, New York
36. Huaxi MR Research Center, West China Hospital, Sichuan University, Chengdu, China
37. Ghent University, Ghent, Belgium
38. The Royal Melbourne Hospital, Australia
39. Carnegie Mellon University

Patents

Multiband RF/MRI Pulse Design for Multichannel Transmitter. U.S. Provisional Patent Application Ser. No. 61/756,775, filed on 1/25/2013. Publication No. US20150362574, published 12/17/2015.

System and Method For Reducing Radio Frequency Peak Voltage and Power Requirements in Magnetic Resonance Imaging Using Time-Shifted Multiband Radio Frequency Pulses. U.S. Provisional Patent Application Ser. No. 61/542,585, filed on 10/3/2011. Publication No. US20140253120/A1, published 9/11/2014.

System and Method For Iteratively Calibrated Reconstruction Kernel For Accelerated Magnetic Resonance Imaging. U.S. Provisional Patent Application Ser. No. 61/759,865, filed on 2/1/2013. Publication No. US20140218026/A1, published 8/7/2014.

Multiband RF/MRI Pulse Design for Multichannel Transmitter. International Application No. PCT/US2014/013004, filed on 1/24/2014. International Publication No. WO/2014/116986, published 7/31/2014.

Presentations

Invited Oral Presentations at National Professional Meetings, Conferences, etc.

1. **Auerbach EJ.** MB EPI Acquisition and Reconstruction for the Human Connectome Project. ISMRM Workshop on Simultaneous Multi-Slice Imaging: Neuroscience & Clinical Applications, Pacific Grove, CA, USA, 2015.
2. **Auerbach EJ.** Bigger, Better, Faster, More! Acquisition and Reconstruction Problems and Solutions for the Human Connectome Project. Siemens North American IDEA Users Group Meeting, Boston, MA, USA, 2014.
3. **Auerbach EJ.** 16X-Accelerated EPI at 7T with multi-banded, multi-slice sampling. Siemens North American IDEA Users Group Meeting, Memphis, TN, USA, 2008.
4. **Auerbach EJ.** Tales of SVS at 3T with Siemens MAGNETOM Trio, ICE & IDEA. Siemens North American IDEA Users Group Meeting, Atlanta, GA, USA, 2005.
5. **Auerbach EJ.** Two-coil Continuous Arterial Spin Labeling at 3T with MAGNETOM Trio & IDEA. Siemens North American IDEA Users Group Meeting, Chicago, IL, USA, 2004.

Peer-reviewed Oral Presentations at Professional Meetings, Conferences, etc.

1. Erturk MA, Wu X, Adriany G, Van de Moortele PF, **Auerbach E**, Grant A, Ugurbil K, Metzger G. A 32-Channel Loop-Dipole Transceiver Array for Body Imaging at 7.0 Tesla. In: Proceedings of the 25th Annual Meeting of ISMRM, Honolulu, HI, USA, 2017. p. 1222.
2. Deelchand D, **Auerbach E**, Marjanska M. Apparent Diffusion Coefficients of the Five Major Metabolites in the Human Brain at 3 T. In: Proceedings of the 25th Annual Meeting of ISMRM, Honolulu, HI, USA, 2017. p. 0408.
3. Wu X, **Auerbach E**, Vu A, Moeller S, Lenglet C, Schmitter S, Van de Moortele PF, Yacoub E, Ugurbil K. High Resolution Whole Brain Diffusion MRI at 7 Tesla Using RF Parallel Transmission. In: Proceedings of the 25th Annual Meeting of ISMRM, Honolulu, HI, USA, 2017. p. 0174.
4. **Auerbach E**, DelaBarre L, Van de Moortele PF, Strupp J, Gumbrecht R, Potthast A, Pirkl G, Moeller S, Hanna B, Grant A, Adriany G, Ugurbil K. An Integrated 32-Channel Transmit and 64-Channel Receive 7 Tesla MRI System. In: Proceedings of the 25th Annual Meeting of ISMRM, Honolulu, HI, USA, 2017. p. 1218.
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TEACHING AND CURRICULUM DEVELOPMENT

Collaborative Efforts and Activities

- Taught sessions and performed demonstrations at the 10th Bi-annual Minnesota Workshops on High and Ultra-High Field Imaging, University of Minnesota, 2015.
- Taught sessions and performed demonstrations at the 9th Bi-annual Minnesota Workshops on High and Ultra-High Field Imaging, University of Minnesota, 2013.
- Taught sessions and performed demonstrations at the 8th Bi-annual Minnesota Workshops on High and Ultra-High Field Imaging, University of Minnesota, 2011.
- Trained MR technicians and graduate students on how to acquire edited spectroscopy data, Centre de Neuro-imagerie de Recherche, Pitié Salpêtrière Hospital, Paris, France, July 16-19, 2007.
- Installed continuous ASL imaging hardware and trained scientists on how to acquire CASL data, Max-Planck-Institut für biologische Kybernetik, Tübingen, Germany, 2007.
- Installed continuous ASL imaging hardware and trained scientists on how to acquire CASL data, Yerkes National Primate Research Center, Atlanta, GA, USA, 2005.
- Taught sessions and performed demonstrations at the 5th Bi-annual Minnesota Workshops on High and Ultra-High Field Imaging, University of Minnesota, 2005.
- Taught sessions and performed demonstrations at the 4th Bi-annual Minnesota Workshops on High and Ultra-High Field Imaging, University of Minnesota, 2003.

PROFESSIONAL SERVICE AND PUBLIC OUTREACH

Service To The Discipline/Profession/Interdisciplinary Area(s)

Journal Reviewer Experience

Ad hoc reviewer, Magnetic Resonance in Medicine, 2010-present

Organization of conferences, workshops, panels, symposia

Abstract reviewer, International Society for Magnetic Resonance in Medicine Annual Meeting, 2014-present

Committee memberships

Member, International Society for Magnetic Resonance in Medicine High Field Study Group, 2014-present

Service to the University/Medical School/Department

University of Minnesota, Center for Magnetic Resonance Research

- Coordinate service, upgrades, and installations for 7T and 10.5T systems. Primary support provider for 7T and 10.5T systems.
- Troubleshooting and accessory installation/maintenance for 3T systems. Secondary support provider for 3T systems.
- Maintain preconfigured virtual machines for other CMRR users for Siemens pulse sequence development.
- Maintain remote reconstruction servers, image reconstruction computer upgrades.
- General pulse sequence programming support for 3T/7T/10.5T systems.
- Maintain coil files for using locally built coils on all Siemens systems; interface with Siemens for documentation and password generation.

- Support 7T/10.5T user meeting.