Ingrid Reiser, PhD

Education:
1989-1995   M.S. (Diplom), Physics, University of Kaiserslautern, Kaiserslautern, Germany
1997-2002   Ph.D., Physics, Kansas State University, Manhattan, KS

Professional Experience:
2002 – 2007   Post-Doctoral Scholar, Department of Radiology, University of Chicago
2007 – 2014   Research Associate (Assistant Professor), Department of Radiology, University of Chicago
2014 - present   Assistant Professor of Radiology, University of Chicago; Committee on Medical Physics

Board certification:
Diagnostic Medical Physics, the American Board of Radiology (2015)

Professional Societies:
2012-   American Association of Physicists in Medicine (AAPM)
2014-   International Society for Optics and Photonics (SPIE)
2015-   Society of Directors of Academic Medical Physics Programs (SDAMPP)

Professional Activities:
2012 – present   Member of AAPM Task Group 234 (on Virtual Tools for the Evaluation of New 3D/4D Breast Imaging Systems)
2014 – present   Member of AAPM Task Group 245 (Tomosynthesis Quality Control)
2015 – present   Member of AAPM Task Group 278 (Combined Residency and Research Training in Medical Physics)
Jan. 2016 – present Member, Medical Physics Editorial Board (AAPM)
Jan. 2016 – present Member, Review Article Subcommittee (AAPM)
2016 – present   Member, Medical Physics Education of Physicians Committee (AAPM)
2017 – present   Member of AAPM Task Group 300 (Establishment of a Framework for a National CT Image Quality Index Registry)
2017 – present   Co-chair, AAPM Task Group 316 (Ultrasound Modality-Specific Display Presentation Consistency)
2017 – present   Co-chair, AAPM Task Group 305 (Development of Standards for Vendor-Neutral Reject Analysis in Radiography)

Meeting Organization
- Professional Track Director, 2016 AAPM annual meeting, Washington, DC
- Professional Track Director, 2017 AAPM annual meeting, Denver, CO
- Annual meeting subcommittee vice-chair, 2018 AAPM annual meeting, Nashville, TN
- SPIE program committee member (2017-present)
- RSNA program committee, 2016 - present (Physics Subcommittee of the Scientific Program Committee)

NIH Study Section Member
- NIH Grant Review Study Section, Early Career Reviewer (BMIT-B), Sept. 2016, Feb. 2017.
- NIH Grant Review Study Section Ad-Hoc member (BMIT-B), June 2017.

Scientific Advisory Board Member
- In-silico imaging clinical trial project at DIDSR/OSEL/CDRH/FDA: VICTRE (Virtual Imaging Clinical Trial for Regulatory Evaluation). Role: Image scientist

Education
- Question writing, ACR RADAR 2 (Radiology assessment and review), 2016

SCHOLARSHIP

Peer-reviewed articles:

1. J. W. Thomsen, **I. Reiser**, N. Andersen, J. C. Houver, J. Salgado, E. Sidky, A. Svensson and D. Dowek, "An Experimental Determination of the Complete Transition Matrix for the Electron Transfer Process Li+ + Na(3s) -> Li(2P) + Na+", Journal of Physics B 29, 5459-5474 (1996).
2. D. Dowek, J. C. Houver, **I. Reiser**, J. Salgado, A. Svensson, J. W. Thomsen, N. Andersen, S. E. Nielsen, and A. Dubois, "Left-right scattering asymmetries for electron transfer from oriented and tilted aligned Na(3p) states to H(n=2,3)", Phys. Rev. A 54, 970-973 (1996).
3. J. Salgado, J. W. Thomsen, N. Andersen, D. Dowek, A. Dubois, J. C. Houver, S. E. Nielsen, **I. Reiser** and A. Svensson, "State propensities in electron transfer processes from optically prepared states: H+ + Na(3s, 3p) -> H(n=2,3) + Na+", Journal of Physics B 30, 3059 - 3075 (1997).
4. C. Courbin, M. Machholm, **I. Reiser**, D. Dowek and J. C. Houver, "Polarization of Li(2p) produced by Li+ - Na(3s) collisions", Journal of Physics B 31, 2305-2319 (1998).
5. M. P. Stockli, K. Carnes, C. L. Cocke, B. D. DePaola, T. Ehrenreich, C. Fehrenbach, D. Fry, P. E. Gibson, S. Kelly, U. Lehnert, V. Needham, **I. Reiser**, P. Richard, T. N. Tipping, B. Walch, A. Cuquemelle, C. Doudna, B. Eastman, U. Kentsch and R. Schedler, N. Kobayashi and J. Matsumoto, S. Madzunkov, "New improvements on the Kansas State University cryogenic electron beam ion source, a user facility for low energy, highly charged ions", Review of Scientific Instruments 71(2), 902 - 905 (2000).
6. C. Y. Chen, C. L. Cocke, J. P. Giese, F. Melchert, **I. Reiser**, M. Stockli, E. Y. Sidky and C. D. Lin, "Studies of Charge Exchange in Symmetric Ion-Ion Collisions", Journal of Physics B 34, 469 - 475 (2001).
7. H. Braeuning, **I. Reiser**, A. Diehl, A. Theiss, E. Sidky, M. Stoekli, C. L. Cocke and E. Salzborn, "Charge transfer in collisions of H2+ ions with He2+ and Ar2+" Journal of Physics B 34, L321-L325
8. D. Dowek, **I. Reiser**, S. Grego, N. Andersen, A. Dubois, J. C. Houver, S. E. Nielsen, C. Richter, J. Salgado, A. Svensson and J. W. Thomsen, "P-state-to-P-state transitions in optically prepared atomic collisions: III. A complete analysis of Li+ + Na(3p) -> Li(2p) + Na+ differential scattering", Journal of Physics B 35, 2051-2068 (2002) .
9. C. D. Lin and **I. Reiser**, "Alignment-Dependent Atomic Model for Electron Transfer in Ion-Molecule Collisions", International Journal of Molecular Sciences 3,132-141 (2002).
10. **I. Reiser** and C. L. Cocke, "Alignment measurements in collisions of D2+ with doubly charged projectiles", Nuclear Instr. and Methods B 205,614-619 (2003).
11. **I. Reiser**, C. L. Cocke and H. Braeuning, "Alignment effects in electron capture from D2+ molecular ions by Ar2+, N2+ and He2+", Physical Review A 67, 062718 (2003).
12. **I. Reiser**, R. M. Nishikawa, M. L. Giger, T. Wu, E. Rafferty, R. Moore, D. B. Kopans, "Computerized detection of mass lesions in digital breast tomosynthesis images using two-and three dimensional radial gradient index segmentation", Technology in Cancer Research and Treatment 3, 437-441 (2004).
13. **I. Reiser**, R. M. Nishikawa, M. L. Giger, T. Wu, E. A. Rafferty, R. Moore, and D. B. Kopans, "Computerized mass detection for digital breast tomosynthesis directly from the projection images", Medical Physics

33(2), 482-491 (2006).

14. **I. Reiser** and R. M Nishikawa, "Identification of simulated microcalcifications in white noise and mammographic backgrounds", Medical Physics 33, 2905-2911 (2006).

15. **I. Reiser**, R. M Nishikawa, A. V. Edwards, R. A. Schmidt, J. Papaioannou, R. Moore and D. B. Kopans, "Automated detection of microcalcification clusters for digital breast tomosynthesis using projection data only: A preliminary study", Medical Physics 35, 1486-1493 (2008).

16. E. E. Engstrom, **I. Reiser**, R. M Nishikawa, "Comparison of power spectra in tomosynthesis reconstruction and projection images", Medical Physics 36, 1753-1758 (2009). https://dx.doi.org/10.1118%2F1.3116774

17. E. Y. Sidky, X. C. Pan, **I. Reiser**, R. M. Nishikawa, R. H. Moore, and D. B. Kopans, "Enhanced imaging of microcalcifications in digital breast through improved reconstruction algorithms", Medical Physics 36, 4920 (2009). https://dx.doi.org/10.1118%2F1.3232211

18. **I. Reiser** and R. M. Nishikawa, "Task-based assessment of tomosynthesis: Effect of acquisition parameters and quantum noise", Medical Physics 37, 1591-1600 (2010). https://doi.org/10.1118/1.3357288

19. **I. Reiser**, S. Lee and R. M. Nishikawa, "On the orientation of mammographic structure", Medical Physics 38, 5303-5307 (2011). https://doi.org/10.1118/1.3633905

20. **I. Reiser**, R. M. Nishikawa, M. L. Giger, J. M. Boone, K. K. Lindfors, K. Yang, "Automated detection of mass lesions in dedicated breast CT: A preliminary study", Medical Physics 39, 866-873 (2012). https://doi.org/10.1118/1.3678991

21. B. A. Lau, **I. Reiser**, R. M. Nishikawa, and P. R. Bakic, "A statistically defined anthropomorphic software breast phantom", Medical Physics 39, 3375-3386 (2012). https://dx.doi.org/10.1118%2F1.4718576

22. A. A. Sanchez, E. Y. Sidky, **I. Reiser**, and X.-C. Pan, "Comparison of human and hotelling observer performance for a fan-beam CT Signal detection task", Medical Physics 40, 031104 (2013) (9 pages).

23. **I. Reiser**, A. Edwards and R. Nishikawa, "Validation of a power-law noise model for simulation of small-scale breast tissue", Phys. Med. Biol. 58, 6011-6027 (2013). https://dx.doi.org/10.1088%2F0031-9155%2F58%2F17%2F6011

24. H.-C. Kuo, M. L. Giger, **I. Reiser**, J. Boone, K. K. Lindfors, K. Yang, A. Edwards, "Level set segmentation of breast masses in contrast-enhanced dedicated breast CT and evaluation of stopping criteria", J. Digit. Imaging 27(2), 237-247 (2014). https://doi.org/10.1007/s10278-013-9652-1

25. H.-C. Kuo, M. L. Giger, **I. Reiser**, K. Drukker, J. M. Boone, K. K. Lindfors, K. Yang, A. Edwards, C. A. Sennett, "Segmentation of breast masses on dedicated breast CT and 3D breast ultrasound images", J. Med. Imag. 1(3) 031012 (2014) (11 pages). http://dx.doi.org/10.1117/1.JMI.1.1.014501

26. **I. Reiser** and I. Sechopoulos, "A review of digital breast tomosynthesis", Medical Physics International Journal, 2(1), 57-66 (2014)

27. E. Y. Sidky, D. N. Kraemer, E. G. Roth, C. Ullberg, I**. S. Reiser**, X. Pan, "Analysis of iterative region-of-interest image reconstruction for x-ray computed tomography." J. Med. Imag. 1(3), 031007 (2014) (16 pages). https://doi.org/10.1117/1.JMI.1.3.031007

28. J. Lee, R. M. Nishikawa**, I. Reiser**, J. M. Boone and K. K. Lindfors. "Local curvature analysis for classifying breast tumors: Preliminary analysis in dedicated breast CT." Med. Phys. 42, 5479 (2015) (11 pages). http://dx.doi.org/10.1118/1.4928479

29. X. Jiang , M. Baad, **I. Reiser**, K. A. Feinstein, Z. F. Lu, "Effect of comfort pads and incubator design on neonatal radiography." Pediatric Radiology, 46 (1), 112-118 (2016). https://doi.org/10.1007/s00247-015-3450-5

30. K. J. Little, **I. Reiser**, L. Liu, T. Kinsey, A. A. Sánchez, K. Haas, F. Baker-Mallory, C. Froman, Z. F. Lu, "Unified database for rejected image analysis across multiple vendors in radiography." Journal of the American College of Radiology, 2017; 14(20), 208-216 (2017). http://dx.doi.org/10.1016/j.jacr.2016.07.011

31. J. Lee, R. M. Nishikawa, **I. Reiser**, M. Zuley, J. M. Boone, "Lack of agreement between radiologists: Implications for image-based model observers." J. Med. Imag, 4(2), 025502, (2017) (11 pages). https://doi.org/10.1117/1.JMI.4.2.025502

32. J. Lee, R. M. Nishikawa, **I. Reiser**, J. M. Boone, "Optimal reconstruction and quantitative image features for Computer-Aided Diagnosis tools for breast CT." Med. Phys. 44(5), 1846-1856 (2017). https://doi.org/10.1002/mp.12214
33. M. Baad, Z. F. Lu, **I. Reiser**, D. Paushter, "Clinical significance of ultrasound artifacts", RadioGraphics 37: 1408–1423 (2017). https://doi.org/10.1148/rg.2017160175
34. J. Lee ; Robert M. Nishikawa ; **I. Reiser** ; J. M. Boone. "Neutrosophic segmentation of breast lesions for dedicated breast computed tomography". J. of Medical Imaging, 5(1), 014505 (2018). https://doi.org/10.1117/1.JMI.5.1.014505
35. A. Ba, C. Abbey, J. Baek, M. Han, R. Bouwman, C. Balta, J. Brankov, F. Massanes, H. C. Gifford, I. Hernandez-Giron, W. J. Veldkamp, D. Petrov, N. Marshall, F. W. Samuelson, R. Zeng, J. B. Solomon, E. Samei, P. Timberg, H. Förnvik, **I. Reiser**, L. Yu, H. Gong, H. and F. O. Bochud, (2018), "Inter-laboratory comparison of Channelized Hotelling Observer computation". Med. Phys. (2018), Accepted Author Manuscript. https://doi.org/10.1002/mp.12940

Conference proceedings:

1. **I. Reiser**, C. E. Metz, R.M. Nishikawa, "Human efficiency in the detection and discrimination tasks," Proc. SPIE 5372, 166, 2004.
2. **I. Reiser**, E. Y. Sidky, M. L. Giger, R. M. Nishikawa, E. A. Rafferty, D. B. Kopans, R. Moore, and T. Wu, "Reconstruction-independent method for computerized mass detection in digital tomosynthesis images of the breast." Proc. SPIE 5370, 833, 2004.
3. **I. Reiser**, R. M. Nishikawa, M. L. Giger, E. A. Rafferty, D. B. Kopans, R. Moore, and T. Wu, "Computerized detection of mammographic masses in digital breast tomosynthesis images using radial gradient index filtering." International Congress Series 1268, 1352, 2004.
4. **I. Reiser**, R. M. Nishikawa, M. L. Giger, T. Wu, E. A. Rafferty, R. Moore, and D. B. Kopans, "Computerized detection of mass lesions in a series of projection images for digital breast tomosynthesis - preliminary results." In: IWDM 2004, E. D. Pisano (ed.), 578-583, 2005.
5. R.M. Nishikawa, Y. Jiang, **I. Reiser**, "What is the required pixel size for digital mammography?" In: IWDM 2004, E. D. Pisano (ed.), 81-85, 2005.
6. **I. Reiser**, R.M. Nishikawa, "Human performance for detection and discrimination of simulated microcalcifications in mammographic backgrounds" Proc. SPIE 5749 223-230, 2005.
7. **I. Reiser**, R. M. Nishikawa, M. L. Giger, T. Wu, E. A. Rafferty, R. Moore, and D. B. Kopans, "A multi-scale 3D radial gradient filter for computerized mass detection in digital tomosynthesis breast images", International Congress Series 1281 1058-1062, (2005).
8. **I. Reiser**, EY Sidky, RM Nishikawa, XC Pan: "Development of an analytic breast phantom for quantitative comparison of reconstruction algorithms for digital breast tomosynthesis", In: Digital Mammography 2006, S. Astley, M. Brady, C. Rose and R. Zwiggelaar (eds.), Lecture notes in computer science, 190-196, (2006).
9. **I. Reiser**, RM Nishikawa, EY Sidky, MR Chinander, P Seifi: "Development of a model for breast tomosynthesis image acquisition", Proc. SPIE 6510 65103D (2007).
10. E. Y. Sidky, **I. Reiser**, RM Nishikawa, X. C. Pan: "Image reconstruction in digital breast tomosynthesis by total variation minimization", Proc. SPIE 6510 651027 (2007).
11. R. M. Nishikawa, **I. Reiser**, P Seifi: "A new approach to digital breast tomosynthesis for breast cancer screening", Proc. SPIE 6510 65103C (2007).
12. **I. Reiser**, J. Bian, R. M. Nishikawa, E. Y. Sidky, X. Pan: "Comparison of reconstruction algorithms for digital breast tomosynthesis", 9th International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine, 155-158 (2007)
13. B. A. Lau, **I. Reiser**, R. M. Nishikawa: "Microcalcification detectability in tomosynthesis", Proc. SPIE 6913 69134L (2008).

14. E. Y. Sidky, **I. Reiser**, R. M. Nishikawa, and X.C. Pan: "Practical iterative reconstruction in digital breast tomosynthesis by non-convex TpV optimization", Proc. SPIE 6913 691328 (2008).
15. **I. Reiser**, B. A. Lau, R. M. Nishikawa: "Effect of scan angle and reconstruction algorithm on model observer performance in tomosynthesis". Digital Mammography/IWDM 2008:606-611.
16. **I. Reiser**, R. M. Nishikawa, B. A. Lau:" Effect of non-isotropic detector blur on microcalcification detectability in tomosynthesis", Proc. SPIE 7258, 72585Z (2009).
17. **I. Reiser**, S. Lee, K. Little, R. M. Nishikawa, "Towards validation of a 3D structured background model for breast imaging", Proc. SPIE 7627, 762716 (2010).
18. **I. Reiser**, S. P. Joseph, R. M. Nishikawa, M. L. Giger, J. Boone, K. Lindfors, A. Edwards, N. Packard, R. H. Moore, D. B. Kopans, "Evaluation of a 3D lesion segmentation algorithm on DBT and breast CT images", Proc. SPIE 7624, 76242N (2010).
19. **I. Reiser**, R. M. Nishikawa: "Human observer performance in a single slice or a volume: Effect of background correlation". Workshop on Digital Mammography / IWDM 2010: 327-333.
20. P. R. Bakic, B. A. Lau, A.-K. Carton, **I. Reiser**, A. D. A. Maidment, Robert M. Nishikawa: An anthropomorphic software breast phantom for tomosynthesis simulation: Power spectrum analysis of phantom projections". Workshop on Digital Mammography / IWDM 2010: 452-458.
21. B. A. Lau, **I. Reiser**, and R. M. Nishikawa, "Issues in characterizing anatomic structure in digital breast tomosynthesis", Proc. SPIE 7961, 796113 (2011).
22. **I. Reiser** and R. M. Nishikawa, "Signal-known exactly detection performance in tomosynthesis: does volume visualization help human observers?", Proc. SPIE 8318, 83180K (2012)
23. H. Kuo, M. L. Giger, I. S. Reiser, J. M. Boone, K. K. Lindfors, K. Yang, and A. Edwards, "Evaluation of stopping criteria for level set segmentation of breast masses in contrast-enhanced dedicated breast CT", Proc. SPIE 8315, 83152C (2012).
24. **I. Reiser**, B. A. Lau, R. M. Nishikawa and P. R. Bakic, "A directional small-scale tissue model for an anthropomorphic breast phantom", In: 11th International Workshop on Breast Imaging (IWDM2012), Lecture Notes in Computer Science 7361, 141-148 (2012).
25. H.-C. Kuo, M. L. Giger, **I. Reiser**, J. M. Boone, K. K. Lindfors, K. Yang and A. Edwards, "Level set breast mass segmentation in contrast-enhanced and non-contrast-enhanced breast CT", In: 11th International Workshop on Breast Imaging (IWDM2012), Lecture Notes in Computer Science 7361, 697-704 (2012)
26. H.-C. Kuo, M. L. Giger, **I. Reiser**, K. Drukker, A. Edwards, C. A. Sennett, "Automatic 3D lesion segmentation on breast ultrasound images", Proc. SPIE 8670, 867025 (2013).
27. **I. Reiser**, E. Y. Sidky, R. M. Nishikawa, K. Yang, J. M. Boone, X.-C. Pan, "Fast, robust dynamic field-of-view adjustment for iterative reconstruction of dedicated breast CT images", 2013 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC).
28. E. Y. Sidky, **I. Reiser**, X. Pan, R. Nishikawa, "Enhancing tissue structures with iterative image reconstruction for digital breast tomosynthesis", Proc. SPIE 9033, Medical Imaging 2014: Physics of Medical Imaging, 90330W (9 pages).
29. E G. Roth, D. N. Kraemer, E. Y. Sidky, I. S. Reiser, X. Pan, "Improving depth resolution in digital breast tomosynthesis by iterative image reconstruction", Proc. SPIE 9412, Medical Imaging 2015: Physics of Medical Imaging, 941258 (2015).
30. D. N. Kraemer, E. G. Roth, E. Y. Sidky, **I. S. Reiser** and X. Pan, "Robust iterative image reconstruction for breast CT by use of projection differentiation ", Proc. SPIE 9412, Medical Imaging 2015: Physics of Medical Imaging, 94123I (2015)
31. N. Antropova; A. Sanchez; **I. Reiser**; E. Y. Sidky; J. Boone; X. Pan. "Efficient iterative image reconstruction algorithm for dedicated breast CT". Proc. SPIE. 9783, Medical Imaging 2016: Physics of Medical Imaging, 97834K.

32. J. Lee, R. M. Nishikawa, **I. Reiser,** J. M. Boone. "Can model observers be developed to reproduce radiologists' diagnostic performances? Our study says not so fast! ". Proc. SPIE. 9787, Medical Imaging 2016: Image Perception, Observer Performance, and Technology Assessment, 978707.
33. J. Lee, R. M. Nishikawa, **I. Reiser**, J. M. Boone. "Neutrosophic segmentation of breast lesions for dedicated breast CT". Proc. SPIE 10134, Medical Imaging 2017: Computer-Aided Diagnosis, 101340Q.
34. D. Modgil, A. Smith, B. Chen, H. J. Kim, W. C. Barber, C. T. Chen, **I. Reiser**, "Development of a photon counting detector response model using multiple transmission spectra", Proc. SPIE 10132, Medical Imaging 2017: Physics of Medical Imaging, 101323R.
35. R. Acciavatti, A. Rodríguez-Ruiz, T. Vent, P. Bakic, **I. Reiser**, I. Sechopoulos, A. D. Maidment, "Analysis of volume overestimation artifacts in the breast outline segmentation in tomosynthesis", Proc. SPIE. 10573, Medical Imaging 2018: Physics of Medical Imaging
36. S. Rose, J. Roth, C. Zimmerman, **I. Reiser**, E. Sidky, X. Pan, "Parameter selection with the Hotelling observer in linear iterative image reconstruction for breast tomosynthesis", Proc. SPIE. 10577, Medical Imaging 2018: Image Perception, Observer Performance, and Technology
37. J. Lee, B. Grant, J. Chung, **I. Reiser**, M. Giger, "Assessment of diagnostic image quality of computed tomography (CT) images of the lung using deep learning". Proc. SPIE. 10573, Medical Imaging 2018: Physics of Medical Imaging
38. S. Rose, **I. Reiser**, E. Sidky, X. Pan, "Orientation dependent detectability of fiber-like signals in linear iterative image reconstruction for breast tomosynthesis", proceedings of the 2018 International Workshop on Breast Imaging (IWBI), July 8 – 11, 2018 in Atlanta, GA.

Books:
I. Reiser and S. Glick, "Tomosynthesis Imaging", CRC press, Boca Raton, 2014

Book chapters:
1. **I. Reiser** and R. M. Nishikawa, "Computerized mass detection for digital breast tomosynthesis", in"Recent advances in breast imaging, mammography, and computer-aided diagnosis of breast cancer", Editors: Jasjit S. Suri, Rangaraj M. Rangayyan, SPIE press, 2006
2. **I. Reiser**, "Image perception and assessment", in "Diagnostic radiology physics: A handbook for teachers and students", Editor: D. McLean, International Atomic Energy Agency, Vienna, 2014.
3. **I. Reiser**, "Tomosynthesis", in "Emerging imaging technologies in medicine", Editors: M. Anastasio and P. J. La Riviere, CRC press, 2013.
4. **I. Reiser**, B. Lau, R. Nishikawa, "Tomosynthesis system modeling", in "Tomosynthesis imaging", Editors: **I. Reiser** and S. Glick, CRC press, 2014.

Online learning modules:
K. Kulkarni, A. Magee, I. Reiser, I. Sechopoulos. Revision of "Mammography Image Quality and Dose". RSNA/AAPM Physics module (2018).