

## Brian W. Miller, Ph.D.

---

CONTACT INFORMATION Assistant Professor - Department of Radiation Oncology  
University of Colorado School of Medicine  
Aurora, CO 80045 USA  
Voice: (720) 848-0184  
E-mail: brian.w.miller@ucdenver.edu

CITIZENSHIP United States of America

EDUCATION **University of Colorado Anschutz Medical Campus**, Aurora, Colorado USA

CAMPEP Accredited Residency in Radiation Oncology Physics **July 2016 - June 2018**

- **Equipment:** Varian Truebeam, Truebeam STX with ExacTrac, Eleka Synergy, Tomotherapy, Gamma Knife, Siemens and Philips CT. QA devices: Sun Nuclear ArcCheck, Profiler, Daily QA, ScandiDos Delta4, microStar nanoDot, Scanning tanks: IBA Blue Phantom, Standard Imaging 1D)
- **Software:** Mosaiq, Aria, Varian Eclipse (RapidArc, IMRT, 3D CRT, and **SBRT**), iPlan RT (**SRS**), Tomotherapy, MIMvista, RadCalc, Tomotherapy.
- **Brachytherapy:** Varian BrachyVision TPS, VariSource iX HDR for cylinder, T&O, Miami. VariSeed LDR TPS for I-125, Pd-103 prostate brachytherapy; I-125 plaque brachytherapy for ocular melanoma
- **Advanced Techniques:** TBI, TSI, DIBH, RPM, Gating

**University of Florida**, Gainesville, Florida, USA

CAMPEP Medical Physics Certificate **March 2016**

**The University of Arizona**, Tucson, Arizona USA

Ph.D., College of Optical Sciences **May 2011**

- Dissertation: High-Resolution Gamma-Ray Imaging with Columnar Scintillators and CCD/CMOS Sensors, and FastSPECT III: A Third-Generation Stationary SPECT Imager
- Advisors: Regents' Professor Harrison H. Barrett and Professor Lars R. Furenlid
- Area of Study: Gamma-ray detectors and the design and development of a high-resolution SPECT imaging system

M.S., College of Optical Sciences **May 2008**

- Advisor: Regents' Professor Harrison H. Barrett
- Area of Study: Gamma-Ray Imaging

B.S., Department of Optical Sciences and Engineering **May 2005**

- *Cum Laude and Honors*
- Minor in Mathematics

PROFESSIONAL EXPERIENCE

**University of Colorado Denver, Anschutz Medical Campus**, Aurora, Colorado

*Assistant Professor, Radiation Oncology* **July 2018 - Present**

**Fred Hutchinson Cancer Research Center**, Seattle, Washington

*Visiting Investigator: Press, Green, Orozco, and Sandmaier Labs* **Mar 2018 - Present**

**College of Optical Sciences, The University of Arizona**, Tucson, Arizona

*Adjunct Assistant Professor* **August 2013 - Present**

- Director of the iQID Collaboration for the Center for Gamma-Ray Imaging (NIH NIBIB P41 Grant). Primary responsibility to establish collaborative efforts and dissemination of the iQID technology, a single-particle CCD/CMOS-based radiation imaging technology, to national and international collaborators for quantitative digital autoradiography in targeted-radionuclide therapy and gamma-ray imaging applications.

*Postdoctoral Research Associate*

**July 2011 - May 2012**

- Development of high-resolution gamma-ray detectors and rapid tomographic reconstruction techniques using high-performance graphic processing units. ’
- Undergraduate student mentor

**Pacific Northwest National Laboratory, Richland, WA**

*Staff Scientist*

**October 2014 - June 2016**

- Development of quantitative digital autoradiography detectors and methods for assessing radionuclide electroplating and activation techniques, efficiency of cementitious waste techniques, and for treaty verification processes.
- Preliminary studies of a single-pixel gamma camera using compressive sensing techniques
- 2D radioxenon gamma/beta spectroscopy
- Isotope spectroscopy using 2D gamma-gamma coincidence data
- Alpha-particle and conversion electron spectroscopy

*Linus Pauling Distinguished Postdoctoral Fellow*

**June 2012 - May 2015**

- Development of single-particle radiation imagers for quantitative digital autoradiography and microdosimetry of alpha-emitters in radioimmunotherapy and radiobiology research.

**BioScan, Inc.**

*Imaging Consultant*

**May-August 2008, April-October 2011**

**CLINICAL  
EXPERIENCE**

- Treatment Planning: 3D, VMAT, SBRT, SRS, HDR gyn (cylinder, T&O, Miami), TBI, TSE
- In vivo dosimetry physics
- Plan review; Initial, weekly, end of treatment chart checks
- LDR brachytherapy involvement throughout entire process of planning, ordering, QA, implant procedure, and documentation: Prostate seed implant (10 cases); Eye Plaque (10 cases)
- Equipment calibration and ADCL calibration for chambers, electrometers, and survey meters
- Linac clinical support & troubleshooting
- Electron cutout and block fabrication

**QA:**

- Linac Monthly (independent): Truebeams (18), Elekta Synergy (12), Truebeam STX (7), Tomotherapy (2 assisted)
- Linac Annual (under supervision): TrueBeam (3), TrueBeam STX (2), Elekta (2), Tomotherapy (1)
- CT Sim: 2 annual, 14 monthly
- Observed Y-90 SIR liver microsphere cases
- Seed assay, Hotlab QA
- IROC linac output

**TEACHING  
EXPERIENCE**

- Resident teaching: Introductory treatment planning for incoming medical and physics residents (2017)
- Undergraduate student mentor (2011-2012)
- Short course lecturer for small-animal imaging workshop (2008, 2016)
- Graduate teaching assistant: Imaging Physics & Devices course (2007)

TECHNICAL SKILLS	<p><b>Clinical medical physics</b></p> <ul style="list-style-type: none"> <li>• Treatment Planning: Eclipse, BrachyVision, Variseed, iPlan RT</li> <li>• R&amp;V Systems: Mosaiq, ARIA</li> </ul> <p><b>Additional</b></p> <ul style="list-style-type: none"> <li>• Programming: C, Nvidia CUDA, Matlab, Python, GEANT 4, GATE</li> <li>• Instrumentation and Control: National Instruments LabVIEW</li> <li>• Iterative Reconstruction Algorithms</li> <li>• Fabrication: SolidWorks, Rapid Prototyping, Traditional Machining</li> </ul>
PROFESSIONAL ASSOCIATIONS	<p>American Association of Physicists in Medicine (AAPM)</p> <ul style="list-style-type: none"> <li>• Molecular Imaging in Radiation Oncology Work Group (WGMIR), 1/1/2019-Present</li> </ul> <p>International Electrical and Electronic Engineers (IEEE)</p> <p>Affiliate Member of CU Cancer Center (2018 - Present)</p> <p>Reviewer for Medical Physics (2016 - Present)</p> <p>Reviewer for The British Institute of Radiology (BIR) (2018 - Present)</p> <p>Reviewer for IEEE Transactions on Radiation and Plasma Medical Sciences (2018 - Present)</p>
EXTRAMURAL FUNDING AWARDS	<p>Pacific Northwest National Laboratory</p> <ul style="list-style-type: none"> <li>• <b>Principle Investigator</b>, "Quantitative Digital Autoradiography for Environmental Swipe Sample Prioritization: System design, Characterization, and Initial Measurements", United States Department of Energy, DOE Contract Number: AC05-76RL01830, 2015-2017</li> </ul>
AWARDS	<p>The University of Arizona</p> <ul style="list-style-type: none"> <li>• <b>Student Innovator of the Year, 2008</b></li> </ul> <p>IEEE</p> <ul style="list-style-type: none"> <li>• IEEE Medical Imaging Conference, Valencia, Spain - Student Paper Award (3rd Place), 2011</li> </ul> <p>SNM, Society of Nuclear Medicine</p> <ul style="list-style-type: none"> <li>• Computer and Instrumentation Young Investigator Award (3rd place), 2010</li> <li>• Young Professionals Committee Best Basic Science (3rd place), 2007</li> <li>• Computer and Instrumentation Young Investigator Award (3rd place), 2007</li> </ul> <p>SPIE, The International Society for Optics and Photonics</p> <ul style="list-style-type: none"> <li>• SPIE Educational Scholarship Award in Optical Science and Engineering, 2009</li> <li>• SPIE Educational Scholarship Award in Optical Science and Engineering, 2005-2007</li> </ul>
PATENTS	<p><b>B. W. Miller</b>, H. H. Barrett, H. B. Barber, and L. R. Furenlid, "Gamma camera including a scintillator and an image intensifier," US Patent 7,928,397 (Apr. 19, 2011).</p> <p><b>B. W. Miller</b>, H. H. Barrett, H. B. Barber, and F. L. R., "X-ray detector including scintillator, a lens array, and an image intensifier," US Patent 8,519,338 (Aug 27, 2013).</p> <p>H. H. Barrett, <b>B. W. Miller</b>, D. Yijun, L. Chen, J. W. Hoppin, and L. Caucci, "Beta and alpha emission tomography for three-dimensional autoradiography," Feb. 3 2015. US Patent 9,977,136</p>
FOREIGN LANGUAGES	<p>Fluent Spanish</p>

A. M. Clarke, B. S. McDonald, M. A. Zalavadia, D. M. Kasperek, and **B. W. Miller**, “Characterization of a Large-Area iQID Imager for Safeguards Applications,” in *2018 Symposium on Radiation Measurements and Applications SORMA XVII*, (accepted 2018).

G. Tabatadze, **B. W. Miller**, and S. Tolmachev, “Mapping Am-241 Spatial Distribution within Anatomical Bone Structures using Digital Autoradiography,” in *Health Physics*, (accepted 2018).

**B. W. Miller**, “Radiation Imagers for Quantitative, Single-Particle Digital Autoradiography of Alpha- and Beta-Particle Emitters,” *Seminars in Nuclear Medicine*, 2018.

R. M. Asmussen, C. I. Pearce, **B. W. Miller**, A. R. Lawter, J. J. Neeway, W. W. Lukens, M. E. Bowden, M. A. Miller, E. C. Buck, R. J. Serne, *et al.*, “Getters for improved technetium containment in cementitious waste forms,” *Journal of Hazardous Materials* **341**, pp. 238–247, 2018.

S. Lamart, **B. W. Miller**, A. Van der Meeren, A. Tazart, J. F. Angulo, and N. M. Griffiths, “Actinide bioimaging in tissues: Comparison of emulsion and solid track autoradiography techniques with the iQID camera,” *PloS one* **12**(10), p. e0186370, 2017.

A. J. Gilbert, **B. W. Miller**, S. M. Robinson, T. A. White, W. K. Pitts, K. D. Jarman, and A. Seifert, “A single-pixel x-ray imager concept and its application to secure radiographic inspections,” *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **861**, pp. 90–97, 2017.

A. Tazart, M.-A. Bolzinger, S. Coudert, S. Lamart, **B. W. Miller**, J. F. Angulo, S. Briançon, and N. M. Griffiths, “Skin absorption of actinides: influence of solvents or chelates on skin penetration ex vivo,” *International Journal of Radiation Biology*, pp. 1–10, 2017.

N. Deshmukh, A. Prinke, **B. Miller**, and J. McIntyre, “Comparison of new and existing algorithms for the analysis of 2D radioxenon beta gamma spectra,” *Journal of Radioanalytical and Nuclear Chemistry* **311**(3), pp. 1849–1857, 2017.

M. P. Dion, **B. W. Miller**, and G. A. Warren, “Alpha and conversion electron spectroscopy of 238,239 Pu and 241 Am and alpha-conversion electron coincidence measurements,” *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **830**, pp. 6–12, 2016.

**B. W. Miller**, S. H. Frost, S. L. Frayo, A. L. Kenoyer, E. Santos, J. C. Jones, D. J. Green, D. K. Hamlin, D. S. Wilbur, D. R. Fisher, *et al.*, “Quantitative single-particle digital autoradiography with  $\alpha$ -particle emitters for targeted radionuclide therapy using the iQID camera,” *Medical physics* **42**(7), pp. 4094–4105, 2015.

B. J. Allen, T. Bäck, A. B. Brill, D. R. Fisher, R. F. Hobbs, R. W. Howell, R. McDevitt, Michael, R. F. Meredith, **B. W. Miller**, S. Palm, J. C. Roeskell, S. Sofoul, H. Song, G. Sgourous, J. Torgue, and M. R. Zalutsky, *MIRD Monograph: Radiobiology and Dosimetry for Radiopharmaceutical Therapy with Alpha-Particle Emitters*, Society of Nuclear Medicine and Molecular Imaging, 2015.

S. H. Frost, S. L. Frayo, **B. W. Miller**, J. J. Orozco, G. C. Booth, M. D. Hylarides, Y. Lin, D. J. Green, A. K. Gopal, J. M. Pagel, T. A. Bäck, D. R. Fisher, and O. W. Press, “Comparative efficacy of 177lu and 90y for anti-cd20 pretargeted radioimmunotherapy in murine lymphoma xenograft models,” *PloS one* **10**(3), p. e0120561, 2015.

S. H. Frost, **B. W. Miller**, T. A. Bäck, E. B. Santos, D. K. Hamlin, S. E. Knoblaugh, S. L. Frayo, A. L. Kenoyer, R. Storb, O. W. Press, *et al.*, “Alpha imaging confirmed efficient targeting of cd45-positive cells after astatine-211 (211at)-radioimmunotherapy for hematopoietic cell transplantation,” *Journal of Nuclear Medicine*, pp. jnumed–115, 2015.

- D. J. Green, M. Shadman, J. C. Jones, S. L. Frayo, A. L. Kenoyer, M. D. Hyilarides, D. K. Hamlin, D. S. Wilbur, E. R. Balkan, Y. Lin, **B. W. Miller**, S. H. Frost, A. K. Gopal, J. J. Orozco, T. A. Gooley, K. L. Laird, B. G. Till, T. Back, B. M. Sandmaier, J. M. Pagel, and O. W. Press, “Astatine-211 conjugated to an anti-cd20 monoclonal antibody eradicates disseminated b-cell lymphoma in a mouse model,” *Blood* **125**(13), pp. 2111–2119, 2015.
- J. S. McCloy, M. Bliss, **B. W. Miller**, Z. Wang, and S. Stave, “Scintillation and luminescence in transparent colorless single and polycrystalline bulk ceramic ZnS,” *Journal of Luminescence* **157**, pp. 416–423, 2015.
- B. W. Miller**, S. J. Gregory, E. S. Fuller, H. H. Barrett, H. Bradford Barber, and L. R. Furenlid, “The iQID camera: An ionizing-radiation quantum imaging detector,” *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 2014.
- M. Dion, M. Liezers, O. T. Farmer III, **B. W. Miller**, S. Morley, C. Barinaga, and G. Eiden, “Improving alpha spectrometry energy resolution by ion implantation with ICP-MS,” *Journal of Radioanalytical and Nuclear Chemistry*, pp. 1–8, 2014.
- G. A. Warren, M. P. Dion, **B. W. Miller**, and G. Tatishvili, “Concepts for alpha coincidence detection,” *Journal of Radioanalytical and Nuclear Chemistry*, pp. 1–13, 2014.
- E. B. Santos, **B. W. Miller**, T. A. Bäck, D. K. Hamlin, D. S. Wilbur, A. L. Kenoyer, S. L. Frayo, O. W. Press, R. Storb, B. M. Sandmaier, *et al.*, “Anti-CD45 monoclonal antibody (Mab) dose optimization for astatine-211 (211at)-radioimmunotherapy (RIT) of relapsed non-hodgkin lymphoma (NHL) in a canine model,” *Blood* **122**(21), pp. 5139–5139, 2013.
- R. Havelin, **B. W. Miller**, H. Barrett, L. Furenlid, J. Murphy, R. Dwyer, and M. Foley, “Design and performance of a small-animal imaging system using synthetic collimation,” *Physics in medicine and biology* **58**(10), p. 3397, 2013.
- H. Bhandari, V. Gelfandbein, S. Miller, A. Agarwal, **B. Miller**, H. Barber, and V. Nagarkar, “Large-area crystalline microcolumnar LaBr<sub>3</sub>:Ce for high-resolution gamma-ray imaging,” *Nuclear Science, IEEE Transactions on* **60**(1), pp. 3–8, 2013.
- B. W. Miller**, R. Van Holen, H. H. Barrett, and L. R. Furenlid, “A system calibration and fast iterative reconstruction method for next-generation SPECT imagers,” *IEEE Transactions on Nuclear Science* **59**, pp. 1990–1996, 2012.
- B. W. Miller**, J. W. Moore, H. H. Barrett, T. Fry, S. Adler, J. Sery, and L. R. Furenlid, “3D printing in X-ray and gamma-ray imaging: A novel method for fabricating high-density imaging apertures,” *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 2011.
- R. M. Dwyer, J. Ryan, R. J. Havelin, J. C. Morris, **B. W. Miller**, Z. Liu, R. Flavin, C. O’Flatharta, M. J. Foley, H. H. Barrett, J. M. Murphy, F. P. Barry, T. O’Brien, and M. J. Kerin, “Mesenchymal stem cell-mediated delivery of the sodium iodide symporter supports radionuclide imaging and treatment of breast cancer,” *STEM CELLS* **29**(7), pp. 1149–1157, 2011.
- H. Barrett, W. Hunter, **B. Miller**, S. Moore, Y. Chen, and L. Furenlid, “Maximum-likelihood methods for processing signals from gamma-ray detectors,” *Nuclear Science, IEEE Transactions on* **56**, pp. 725–735, June 2009.
- B. W. Miller**, H. H. Barrett, L. R. Furenlid, H. B. Barber, and R. J. Hunter, “Recent advances in BazookaSPECT: Real-time data processing and the development of a gamma-ray microscope,” *Nuclear Inst. and Methods in Physics Research, A* **591**(1), pp. 272–275, 2008.
- V. V. Nagarkar, I. Shestakova, V. Gaysinskiy, B. Singh, **B. W. Miller**, and H. B. Barber, “Fast X-ray/ $\gamma$ -ray imaging using electron multiplying CCD-based detector,” *Nuclear Inst. and Methods in Physics Research, A* **563**(1F), pp. 45–48, 2007.

TECHNICAL  
REPORTS

B. S. McDonald, M. A. Zalavadia, **B. W. Miller**, M. Bliss, K. B. Olsen, D. M. Kasperek, and A. M. Clarke, “Quantitative digital autoradiography for environmental swipe sample prioritization: System design, characterization, and initial measurements,” tech. rep., Pacific Northwest National Laboratory (PNNL), Richland, WA (US), 2017.

R. M. Asmussen, C. I. Pearce, K. E. Parker, **B. W. Miller**, B. D. Lee, E. C. Buck, N. M. Washton, M. E. Bowden, A. R. Lawter, E. M. McElroy, *et al.*, “Solid state characterizations of long-term leached cast stone monoliths,” tech. rep., Pacific Northwest National Lab.(PNNL), Richland, WA (United States), 2016.

M. P. Foxe, **B. W. Miller**, R. Suarez, and J. C. Hayes, “A figure-of-merit for beta cell detector characterization,” tech. rep., Pacific Northwest National Lab.(PNNL), Richland, WA (United States), 2015.

CONFERENCE  
PROCEEDINGS

L. Han, **B. W. Miller**, H. H. Barrett, H. B. Barber, and L. R. Furenlid, “Applications of iQID cameras,” in *Radiation Detectors in Medicine, Industry, and National Security XVIII*, **10393**, p. 103930P, International Society for Optics and Photonics, 2017.

G. Tabatadze, **B. W. Miller**, and S. Tolmachev, “Digital autoradiography of Am-241 spatial distribution within trabecular bone regions,” in *Health Physics*, **111**, p. S41, 07 2016.

L. Han, **B. W. Miller**, H. B. Barber, and L. R. Furenlid, “Advances in iqid: Upgraded algorithms, thicker scintillators and larger area,” in *Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), 2015 IEEE*, pp. 1–3, IEEE, 2015.

L. Han, **B. W. Miller**, H. B. Barber, V. V. Nagarkar, and L. R. Furenlid, “A new columnar CsI (Tl) scintillator for iQID detectors,” in *SPIE Optical Engineering+ Applications*, pp. 92140D–92140D, International Society for Optics and Photonics, 2014.

H. B. Barber, D. Fastje, D. Lemieux, G. P. Grim, L. R. Furenlid, **B. W. Miller**, P. Parkhurst, and V. V. Nagarkar, “Imaging properties of pixellated scintillators with deep pixels,” in *SPIE Optical Engineering+ Applications*, pp. 92150F–92150F, International Society for Optics and Photonics, 2014.

M. P. Dion, **B. W. Miller**, G. Tatishvili, and G. A. Warren, “Alpha coincidence spectroscopy studied with GEANT4,” in *Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), 2013 IEEE*, pp. 1–3, IEEE, 2013.

G. A. Warren, M. P. Dion, **B. W. Miller**, and G. Tatishvili, “Alpha coincidence detection for the assay of actinides,” in *Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), 2013 IEEE*, pp. 1–8, IEEE, 2013.

R. J. Havelin, **B. W. Miller**, H. H. Barrett, L. R. Furenlid, J. M. Murphy, and M. J. Foley, “A SPECT imager with synthetic collimation,” *Proc. SPIE* **8853**, pp. 885309–885309–10, 2013.

D. Fastje, H. B. Barber, V. Bora, D. Lemieux, **B. W. Miller**, and G. P. Grim, “Preliminary investigation of the non-linear response of image intensifiers used for gamma-ray imaging,” *Proc. SPIE* **8854**, pp. 88540J–88540J–13, 2013.

**B. W. Miller**, H. B. Barber, H. H. Barrett, Z. Liu, V. V. Nagarkar, and L. R. Furenlid, “Progress in BazookaSPECT: high-resolution dynamic scintigraphy with large-area imagers,” in *SPIE Optical Engineering+ Applications*, pp. 85080F–85080F, International Society for Optics and Photonics, 2012.

H. Bhandari, H. B. Barber, C. Dumas, H. Kudrolli, **B. W. Miller**, G. T. Chac, L. Han, and V. V. Nagarkar, “Crystalline microcolumnar CsI:Tl films for use in gamma-ray imaging with depth-of-interaction sensitivity,” in *SPIE Optical Engineering+ Applications*, pp. 85080A–85080A, International Society for Optics and Photonics, 2012.

G. T. Chac, **B. W. Millerr**, K. Shah, G. Baldoni, K. J. Domanik, V. Bora, N. J. Cherepy,

Z. Seeley, and H. B. Barber, “The uniformity and imaging properties of some new ceramic scintillators,” in *SPIE Optical Engineering+ Applications*, pp. 85080H–85080H, International Society for Optics and Photonics, 2012.

**B. W. Miller**, R. Van Holen, H. Barrett, and L. Furenlid, “A system calibration and fast iterative reconstruction method for next-generation SPECT imagers,” *Nuclear Science Symposium Conference Record, 2011. IEEE*, 2011.

H. B. Bhandari, V. Gelfandbein, S. R. Miller, A. Agarwal, **B. W. Miller**, H. B. Barber, and N. V. V., “Large-Area Crystalline Microcolumnar LaBr<sub>3</sub>:Ce for High-Resolution Gamma Ray Imaging,” *Nuclear Science Symposium Conference Record, 2011. IEEE*, 2011.

R. Van Holen, **B. W. Miller**, J. W. Moore, S. Vandenberghe, and H. Barrett, “Object-space interpolation of SPECT system matrices from point-source measurements,” *Fully 3D Proceedings*, pp. 419–422, 2011.

D. A. Lemieux, C. Baudet, G. P. Grim, H. B. Barber, **B. W. Miller**, D. Fastje, and L. R. Furenlid, “Investigation of the possibility of gamma-ray diagnostic imaging of target compression at NIF,” in *Proc. of SPIE Vol.*, **8144**, 2011.

S.-E. Strand, M. Peterson, K. Ljunggren, L. Andersson-Ljus, and **B. Miller**, “A method for using high density fusible rose’s metal with high precision machining in small animal imaging applications,” *Nuclear Science Symposium Conference, 2010. IEEE pp.* 3155–3157, 2010.

H. Fan, H. Durko, S. Moore, J. Moore, **B. W. Miller**, L. Furenlid, S. Pradhan, and H. Barrett, “DR with a DSLR: digital radiography with a digital single-lens reflex camera,” in *Proceedings of SPIE*, **7622**, p. 76225E, 2010.

**B. W. Miller**, S. Moore, H. Barber, L. Furenlid, and H. H. Barrett, “System Integration of FastSPECT III, a Dedicated SPECT Rodent-Brain Imager Based on BazookaSPECT Detector Technology,” *Nuclear Science Symposium Conference Record, 2009. IEEE*, pp. 4004–4008, 2009.

**B. W. Miller**, J. Moore, M. Gehm, L. Furenlid, and H. H. Barrett, “Novel Applications of Rapid Prototyping in Gamma-ray and X-ray Imaging,” *Nuclear Science Symposium Conference Record, 2009. IEEE*, pp. 3322–3326, 2009.

M. Peterson, **B. W. Miller**, K. Ljunggren, and S.-E. Strand, “Construction of a Pre-Clinical High Resolution Tomographic Scintillation Camera System,” *Nuclear Science Symposium Conference Record, 2009. IEEE*, pp. 3670–3671, 2009.

**B. W. Miller**, H. B. Barber, L. R. Furenlid, S. K. Moore, and H. H. Barrett, “Progress of BazookaSPECT,” **Invited Paper** –*Penetrating Radiation Systems and Applications X 7450(1)*, p. 74500C, SPIE, 2009.

V. V. Nagarkar, S. Miller, B. Singh, S. Thacker, V. Gaysinskiy, **B. Miller**, H. B. Barber, and D. W. Wilson, “Development of microcolumnar LaBr<sub>3</sub>:Ce scintillator,” *Penetrating Radiation Systems and Applications X 7450(1)*, p. 745006, SPIE, 2009.

**B. W. Miller**, H. B. Barber, H. H. Barrett, L. Chen, and S. J. Taylor, “Photon-counting gamma camera based on columnar CsI (Tl) optically coupled to a back-illuminated CCD,” in *Proc. of SPIE Vol.*, **6510**, pp. 65100N–1, 2007.

**B. W. Miller**, H. B. Barber, H. H. Barrett, D. W. Wilson, and L. Chen, “A low-cost approach to high-resolution, single-photon imaging using columnar scintillators and image intensifiers,” *Nuclear Science Symposium Conference Record, 2006. IEEE* **6**, pp. 3540–3545, 29 2006-Nov. 1 2006.

I. Shestakova, V. V. Nagarkar, V. Gaysinskiy, G. Entine, B. C. Stack, and **B. W. Miller**, “Feasibility studies of an EMCCD-based beta imaging probe for radioguided thyroid surgery,” in *Proc. of SPIE Vol.*, **6319**, pp. 63191E–1, 2006.

**B. W. Miller**, H. B. Barber, H. H. Barrett, I. Shestakova, B. Singh, V. V. Nagarkar, and R. Incorporated, "Single-photon spatial and energy resolution enhancement of a columnar CsI (TI)/EMCCD gamma-camera using maximum-likelihood estimation," in *Proc. of SPIE Vol.*, **6142**, pp. 61421T-1, 2006.

ABSTRACTS AND  
PRESENTATIONS

D. Seiter, **B. W. Miller**, E. Fung, S. Cheal, S. Maitrejean, P. Zanzonico, S. Larson, S. Solomon, J. L. Humm, L. R. Furenlid, A. S. Kirov, "Particle Counting Autoradiography of Radioactive Biopsy Specimens," 2018. European Association of Nuclear Medicine (EANM), EP-1005, Düsseldorf, Germany, 13-17 October, 2018.

**B. W. Miller**, T. Alexeev, D. Thomas, K. Stuhr, B. Kavanagh, M. Miften and C. Altunbas, "CBCT-Based Dose Calculations with a Two-Dimensional Anti-Scatter Grid Prototype: The Effect of Scatter Suppression On Dose-Calculation Accuracy," 2018. American Association of Physicists in Medicine (AAPM), Nashville, Tennessee, U.S.A. July 29-August 2, 2018.

T. Alexeev, **B. W. Miller**, B. Kavanagh, M. Miften and C. Altunbas, "Development of High Aspect Ratio Two-Dimensional Antiscatter Grids for CBCT," 2018. American Association of Physicists in Medicine (AAPM), Nashville, Tennessee, U.S.A. July 29-August 2, 2018.

B. Jones, **B. W. Miller**, C. Altunbas, and M. Miften, "Measuring Marker Motion and Tumor Position During Treatment with Coded-Aperture Compton Imaging," 2018. American Association of Physicists in Medicine (AAPM), Nashville, Tennessee, U.S.A. July 29-August 2, 2018.

L. Han, **B. W. Miller**, and L. R. Furenlid, "LA-iQID: A novel high-resolution CCD-based gamma camera for lymphatic imaging," 2017. IEEE Nuclear Science Symposium and Medical Imaging Conference, Atlanta, Georgia, U.S.A., 21-28 October, 2017.

L. Han, L. Caucci, **B. W. Miller**, H. H. Barrett, J. M. Woolfenden, and L. R. Furenlid, "System Calibration for FASTSPECT III: An Ultra-High Resolution CCD-Based Pinhole SPECT System," 2017. IEEE Nuclear Science Symposium and Medical Imaging Conference, Atlanta, Georgia, U.S.A., 21-28 October, 2017.

G. Tabatadze, **B. W. Miller**, and S. Y. Tolmachev, "Digital Autoradiography of Bone-Seeking Radionuclides in Humans," 2017. 6th Asia-Pacific Symposium on Radiochemistry Jeju Island, Korea, September 17-22, 2017.

R. M. Asmussen, C. I. Pearce, A. R. Lawter, **B. W. Miller**, J. J. Neeway, B. Lawler, G. L. Smith, R. J. Serne, D. J. Swanberg, and N. P. Qafoku, "Preparation, Performance and Mechanism of Tc and I Getters in Cementitious Waste Forms - 17124," 43rd Annual Waste Management Conference (WM2017) Conference, March 5 - 9, 2017, Phoenix, Arizona, USA.

N. Deshmukh, A. Prinke, J. McIntyre, and **B. Miller**, "Analyzing Beta-Gamma spectra of Xe Isotopes using Successive and Simultaneous fitting algorithms," IEEE Symposium on Radiation Measurements and Applications, University of California, Berkeley, California, U.S.A., May 22-26, 2016.

**B. W. Miller**, "Quantitative Single-Particle Digital Autoradiography of Alpha- and Beta-Emitters with the iQID Camera," 3rd Biennial Workshop on Small-Animal SPECT Imaging, Tucson, Arizona, January 10-13, 2016.

**B. W. Miller**, G. Tabatadze, M. Dion, S. Frost, J. Orozco, O. Press, B. Sandmaier, M. Miederer, C. Brochhausen, and S. Y. Tolmachev, "Quantitative Single-Particle Digital Autoradiography with the ionizing-Radiation Quantum Imaging Detector," 2015. Health Physics Society 60th Annual Meeting, Indianapolis, Indiana, July 12-16, 2015.

G. Tabatadze, **B. W. Miller**, and S. Y. Tolmachev, "Radionuclide Distribution Measurement



within Anatomical Bone Structures using Digital Autoradiography,” 2015. Health Physics Society 60th Annual Meeting, Indianapolis, Indiana, July 12-16, 2015.

**B. W. Miller**, M. Miederer, C. Brochhausen, M. Dion, G. Tabatadze, S. Y. Tolmachev, s. H. Frost, J. Orozco, O. Press, and B. Sandmaier, “Quantitative Single-Particle Digital Autoradiography and Imaging Applications of the iQID Alpha Camera,” 2015. 9th Symposium on Targeted Alpha Therapy in Warsaw, Poland May 19-22, 2015.

**B. W. Miller**, M. P. Dion, J. Orozco, S. Frost, A. Kenoyer, S. L. Frayo, A. H. Hernandez, D. J. Green, M. D. Hylarides, D. S. Wilbur, D. R. Fisher, O. Press, J. M. Pagel, and B. M. Sandmaier, “Single-Particle Digital Autoradiography of  $\alpha$  and  $\beta$  Emitters with the iQID Camera,” EANM’14 - Annual Congress of the European Association of Nuclear Medicine, Gothenburg, Sweden, October 18-22, 2014.

S. Frost, **B. Miller**, T. Back, E. Santos, D. Hamlin, O. Press, R. Storb, D. S. Wilbur, B. Sandmaier, and J. Pagel, “Anti-CD45 monoclonal antibody (mAb) dose optimization for astatine-211 (At-211)-radioimmunotherapy (RIT) of relapsed non-hodgkin lymphoma (NHL) in a canine model,” *J NUCL MED MEETING ABSTRACTS* **55**(1 MeetingAbstracts), p. 637, 2014.

**B. W. Miller**, J. Orozco, S. L. Frayo, S. Frost, A. Kenoyer, D. R. Fisher, M. Bliss, L. R. Furenlid, D. K. Hamlin, D. S. Wilbur, E. Balkin, M. D. Hylarides, B. M. Sandmaier, O. Press, and J. M. Pagel, “Beta-Particle Digital Autoradiography with the iQID Camera,” 2013. IEEE Nuclear Science Symposium and Medical Imaging Conference, Seoul, Korea, November 1, 2013.

**B. W. Miller**, H. H. Barrett, L. R. Furenlid, and H. B. Barber, “The iQID Camera: An Ionizing-Radiation Quantum Imaging Detector,” 2013. 15th International Workshop on Radiation Imaging Detectors (IWORID), Paris, France, June 23-27, 2013.

M. Peterson, J. Ahlstedt, M. Lempart, L. Andersson-Lju, B. Blad, **B. W. Miller**, L. Furenlid, and S. S-E., “Progress Report: InSPECT small animal imaging system,” 2013. 15th International Workshop on Radiation Imaging Detectors (IWORID), Paris, France, June 23-27, 2013.

**B. W. Miller**, D. R. Fisher, L. R. Furenlid, J. M. Pagel, A. Kenoyer, S. Frost, D. S. Wilbur, D. K. Hamlin, E. Santos, O. Press, and B. M. Sandmaier, “Digital Autoradiography with the iQID Alpha Camera,” 2013. 8th International Symposium on Targeted Alpha Therapy, Oak Ridge, Tennessee, June 5-6, 2013.

**B. W. Miller**, S. Moore, V. Nagarkar, H. B. Barber, L. R. Furenlid, and H. H. Barrett, “High-Resolution gamma-ray and SPECT imaging with columnar scintillators and CCD/CMOS sensors,” Nuclear Medicine, Physics, Engineering and Practice Workshop, Kharkov, Ukraine, 19-21 September, 2011.

R. Havelin, M. Foley, **B. W. Miller**, and H. H. Barrett, “Development of a novel synthetic collimator small animal SPECT imaging system,” European Medical Physics and Engineering Conference, Trinity College, Dublin, Ireland, 1-3 September, 2011.

**B. W. Miller**, S. Moore, R. Van Holen, H. B. Barber, V. Nagarkar, L. Furenlid, and H. Barrett, “FastSPECT III: A third-generation high-resolution dynamic SPECT imager,” 57th Annual Meeting of the Society of Nuclear Medicine, Salt Lake City, UT, June 5-9, 2010.

**B. W. Miller**, S. K. Moore, H. B. Barber, T. P. Trouard, H. H. Barrett, and L. R. Furenlid, “FastSPECT III: A Third-Generation High-Resolution Dynamic SPECT Imager,” *Arizona Alzheimers Research Consortium*, May 21, 2010.

R. Dwyer, J. Ryan, R. Havelin, J. Morris, C. O’Flatharta, G. Duffy, **B. Miller**, Z. Liu, H. Barrett, M. Murphy, F. Barry, T. O’Brien, and M. Kerin, “Sodium iodide symporter (NIS) mediated tracking of mesenchymal stem cell (MSC) migration to breast tumours in vivo,” *Human Gene Therapy* **20**(11), pp. 1546–1558, 2009. European Society for Gene and Cell therapy (ESGCT).

**B. W. Miller**, S. K. Moore, H. H. Barrett, T. Trouard, H. B. Barber, and L. R. Furenlid, "System integration of FastSPECT III, a dedicated rodent-brain SPECT imager," *Arizona Alzheimers Research Consortium*, May 29, 2009.

V. V. Nagarkar, S. Miller, B. Singh, S. Thacker, V. Gaysinskiy, **B. W. Miller**, and H. B. Barber, "Polycrystalline and columnar growth of LaBr<sub>3</sub>:Ce scintillator," *presented at the IEEE NSS/MIC Conference, N40-6*, Oct. 22, 2008.

**B. W. Miller**, "BazookaSPECT," 3rd Biennial Workshop on Small-Animal SPECT Imaging, Tucson, Arizona, January 16-18, 2008.

**B. W. Miller**, "CCD-based x-ray and gamma-ray detectors," Center for Gamma-Ray Imaging Industrial Outreach Symposium, December 6, 2007.

**B. W. Miller**, G. Stevenson, T. Trouard, H. H. Barrett, and L. R. Furenlid, "FastSPECT III, a dedicated rodent-brain imager," *Poster Presented at the Arizona Health Sciences Center Frontiers in Biomedical Research Poster Forum*, October 17, 2007.

**B. W. Miller**, H. H. Barrett, L. R. Furenlid, and H. B. Barber, "Real-time data acquisition and maximum-likelihood estimation for a new generation of high-resolution gamma-ray detectors," 9th International Workshop on Radiation Imaging Detectors (IWORID), Erlangen, Germany, July 22-26, 2007.

**B. W. Miller**, H. H. Barrett, H. B. Barber, and D. W. Wilson, "Gamma-ray microscopy using micro-coded apertures and BazookaSPECT, a low-cost, high-resolution image intensifying gamma camera," 54th Annual Meeting of the Society of Nuclear Medicine, Washington, DC, June 2-6, 2007.

M. B. Abbott, H. B. Barber, Y.-C. Chen, E. Clarkson, L. R. Furenlid, M. A. Kupinski, Z. Liu, **B. W. Miller**, G. Stevenson, D. W. Wilson, J. M. Woolfenden, and H. H. Barrett, "Recent developments in the Center For Gamma-Ray Imaging," June 19-20, 2006.

**B. W. Miller**, G. Stevenson, T. Trouard, H. H. Barrett, and L. R. Furenlid, "FastSPECT III, a dedicated rodent-brain imager," *Arizona Alzheimers Research Consortium*, May 18, 2007.

**B. W. Miller**, "Single-photon spatial and energy resolution enhancement of a columnar CsI(Tl) EMCCD gamma camera using maximum-likelihood estimation," Presented at Center for Gamma-Ray Imaging, 2nd Bi-Annual Workshop on Small-Animal SPECT Imaging, March 8-10, 2006.

INVITED TALKS **B. W. Miller**, "Development & Applications of the iQID Camera, a Quantitative Single-Particle Imager," Washington State University, School of Mechanical and Materials Engineering Seminar, Pullman, Washington, November 9, 2018.

**B. W. Miller**, "Camera Development: A Quantitative, Single-Particle Imaging Detector for Small-animal SPECT and Targeted Radionuclide Therapy," Subatech Laboratory, Laboratory of Subatomic Physics and Associated Technologies, Universite de Nantes, Nantes, France, June 21, 2018.

**B. W. Miller**, "Quantitative, Single-Particle Digital Autoradiography of Alpha- and Beta-Emitters for Targeted Radionuclide Therapy," Memorial Sloan Kettering Cancer Center, New York City, New York, November 13, 2017.

**B. W. Miller**, "Quantitative, Single-Particle Digital Autoradiography of Alpha- and Beta-Emitters for Targeted Radionuclide Therapy," University of Saskatchewan, Saskatoon, Canada, October 16, 2017.

**B. W. Miller**, "Quantitative, Single-Particle Digital Autoradiography of Alpha- and Beta-Emitters for Targeted Radionuclide Therapy," Department Presentation, University of Colorado Hospital, Department of Radiation Oncology, Aurora, Colorado, U.S.A., September 14, 2017.

**B. W. Miller**, “Quantitative, Single-Particle Digital Autoradiography of Alpha- and Beta-Emitters with the iQID Camera,” Moffitt Cancer Center, Tampa, Florida, U.S.A., July 21, 2017.

**B. W. Miller**, “Quantitative Single-Particle Digital Autoradiography of Alpha and Beta Emitters with the iQID Camera,” Commissariat Energie Atomique (CEA), Radiation Toxicology Laboratory, Bruyeres-le-Chatel, France, April 15, 2015.

**B. W. Miller**, “Imaging Particles from Radioactive Decay and Applications for Medical Imaging,” MSF Medical Radiation Physics Nuclear Medicine Group, Lund University, Sweden, October 24, 2014.

**B. W. Miller**, “Digital Autoradiography for Microdosimetry in Cancer Treatment,” EURADOS - Internal Dosimetry (WG7), National Centre of Nuclear Research (NCBJ), Warsaw, Poland, October 1, 2014.

**B. W. Miller**, “Applications of Digital Autoradiography,” United States Transuranium & Uranium Registries (USTUR), 2014 Scientific Advisory Committee Meeting, Washington State University, Richland, WA, September 5, 2014.

**B. W. Miller**, P. M. Johns, G. Otto, S. Pektor, C. Brochhausen, and M. Miederer, “Alpha-particle imaging applications with the iQID camera,” SPIE Optics + Photonics 2014, Penetrating Radiation Systems and Applications X, San Diego, CA, USA, August 21, 2014.

**B. W. Miller**, “Imaging Particles from Radioactive Decay and Applications for Medical Imaging,” College of Optical Sciences Colloquium Lecture Series, The University of Arizona, Tucson, AZ, USA, January 23, 2014.

**B. W. Miller**, J. Orozco, S. L. Frayo, S. Frost, A. Kenoyer, D. R. Fisher, M. Bliss, L. R. Furenlid, D. K. Hamlin, D. S. Wilbur, E. Balkin, M. D. Hylarides, B. M. Sandmaier, O. Press, and J. M. Pagel, “Digital Autoradiography with the iQID Alpha and Beta Camera,” 2013. UNIVERSITÄTSMEDIZIN der Johannes Gutenberg-Universität Mainz, Mainz, Germany, November 20, 2013.

**B. W. Miller**, “The iQID Camera: An Ionizing-Radiation Quantum Imaging Detector,” Fred Hutchinson Cancer Research Center Seminar, Seattle, WA, January 22, 2013.

**B. W. Miller**, “High-Resolution Gamma-Ray and SPECT Imaging with BazookaSPECT Detectors,” Arizona Research Institute for Biomedical Imaging March 23, 2012.

**B. W. Miller**, “High-Resolution Gamma-Ray and SPECT Imaging with Columnar Scintillators and CCD/CMOS Sensors,” Department of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign, February 28, 2012.

**B. W. Miller**, H. B. Barber, L. R. Furenlid, S. K. Moore, and H. H. Barrett, “Progress in BazookaSPECT,” SPIE Optics + Photonics 2009, Penetrating Radiation Systems and Applications X, San Diego, CA, USA, August 6, 2009.

H. H. Barrett, W. C. J. Hunter, **B. W. Miller**, S. K. Moore, Y. Chen, and L. R. Furenlid, “Maximum-likelihood methods for processing signals from gamma-ray detectors,” Plenary talk, SORMA West 2008, Berkeley, California, June 2-5, 2008.

**B. W. Miller**, “Advances in BazookaSPECT: CGRI, University of Arizona/NUI Galway collaboration,” University of Ireland, Galway, Regenerative Medicine Institute (REMEDI), May 28, 2008.

**B. W. Miller**, “CCD-based gamma-ray detectors,” University of Arizona, College of Optical Sciences - Industrial Affiliates Meeting, March 4, 2008.

**B. W. Miller**, “Advances in CCD-based gamma-ray and x-ray detectors,” University of Arizona, College of Medicine - Radiology Research Series, February 27, 2008.

**B. W. Miller**, “Center for Gamma-Ray Imaging BazookaSPECT detector,” Lunds Universitet, Department of Radiation Physics, August 7, 2007.

**B. W. Miller**, “High-resolution imaging with a new generation of gamma-ray detectors,” University of Arizona, College of Medicine - Radiology Research Series, April 11, 2007.

RADIATION  
ONCOLOGY  
PHYSICS

PRESENTATIONS

**B. W. Miller**, “Theory and Operation of Radiation Detectors,” University of Colorado Hospital, Radiation Oncology Physics Presentation, August 23, 2016.

**B. W. Miller**, “Monitor Unit Calculations,” University of Colorado Hospital, Radiation Oncology Physics Presentation, February 21, 2017.

**B. W. Miller**, “Linac Design and IMRT Principles,” University of Colorado Hospital, Radiation Oncology Physics Presentation, May 1, 2017.

**B. W. Miller**, “Calibration of Radiation Producing Equipment,” University of Colorado Hospital, Radiation Oncology Physics Presentation, July 25, 2017.

**B. W. Miller**, “Brachytherapy Dose Calculation,” University of Colorado Hospital, Radiation Oncology Physics Presentation, September 29, 2017.

**B. W. Miller**, “Imaging Principles in Radiation Oncology,” University of Colorado Hospital, Radiation Oncology Physics Presentation, January 4, 2018.

**B. W. Miller**, “Treatment Planning Algorithms,” University of Colorado Hospital, Radiation Oncology Physics Presentation, April 11, 2018.

**B. W. Miller**, “Shielding Design and Radiation Protection,” University of Colorado Hospital, Radiation Oncology Physics Presentation, June 13, 2018.