ASHOK TIWARI, Ph.D.

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EDUCATION

2017 - 2022	University of Iowa, Department of Physics, Iowa City, IA, USA Ph.D. in physics Advisor: John Sunderland Thesis: "*Monte Carlo Simulations and Phantom Measurements towards more Quantitative Dosimetry and Imaging in Nuclear Medicine*"
2015 - 2017	University of South Dakota, Department of Physics, Vermillion, SD, USA MS in Physics, *Magna Cum Laude*
2008 - 2012	Tribhuvan University, Central Department of Physics, Kathmandu, Nepal MSc in Physics
2005 - 2008	Tribhuvan University, National Multiple College, Lalitpur, Nepal BSc in Physics

RESEARCH INTERESTS

Medical Physics, Radiation Physics, Radiopharmaceutical therapy dosimetry, Monte Carlo Simulations

RESEARCH EXPERIENCE

8/2022 -	Postdoctoral Research Associate Computational Sciences and Engineering Division, Oak Ridge National Laboratory, TN.
7/2022 - 8/2022	Postdoctoral Research Scholar Department of Radiology, University of Iowa City, Iowa City, Iowa.
6/2018 - 5/2022	Graduate Research Assistant Department of Physics and Radiology, University of Iowa, Iowa City, Iowa.
8/2015 - 5/2017	Graduate Research Assistant Department of Physics, University of South Dakota, Vermillion, South Dakota.

TEACHING AND PROFESSIONAL EXPERIENCE

- Programmer, MFM SPECT Project, Department of Radiology, University of Washington, Seattle (9/2021 - 7/2022)
- Teaching Assistant, Department of Physics, University of Iowa (Aug 2017 - Aug 2018)
- Teaching Assistant, University of South Dakota (Aug 2015 - May 2017)
- Physics lecturer, SS College, Bhaktapur, Nepal (Feb 2013 - Jan 2015)
- Radiographer, Sunshine Medical, Kathmandu, Nepal (Jan 2012 - Jun 2012)

FELLOWSHIPS, AWARDS AND SCHOLARSHIPS

- Ballard and Seashore Dissertation Fellowship 2022 (award amount $10,500).
- Research Assistantship, Department of Physics and Radiology, University of Iowa.
- Teaching Assistantship, Department of Physics, University of Iowa.
- Teaching Assistantship, Department of Physics, University of South Dakota.
- Graduate Assistantship, Central Department of Physics, Tribhuvan University, Nepal.

- Scholarship (NPR 25,000) from Ministry of Environment, Science and Technology, Nepal.
- Travel award ($1000), Seoul National University, Seoul Korea, to attend "11th Edoardo Amaldi Conference on Gravitational Waves", June 21-26 (2015), Gwangju, South Korea.
- Scholarship and travel support ($800), International graduate summer school in Aeronautics and Astronautics, July 15-23 (2014), Beihang University, Beijing, China.

JOURNAL PUBLICATIONS (Most recent to earliest)

10. **Tiwari A.**, Merrick M., Graves S., and Sunderland J. J. Monte Carlo evaluation of hypothetical long axial field-of-view PET scanner using GE Discovery MI PET front-end architecture, *Med Phys*, 2022; 49:1139-1152.
9. Graves S., Martin M., **Tiwari A**., Merrick M., and Sunderland J. J. SIR-Spheres® activity measurements reveal systematic miscalibration, *JNM*, 2022, jnumed.121.262650; DOI: 10.2967/jnumed.121.262650.
8. Graves S., **Tiwari A.**, Merrick M. J., Hyer D., Flynn R., Kruzer A., Nelson A., Dewaraja Y., Mirando D., and Sunderland J. J. Accurate resampling of radial dose point kernels to a Cartesian matrix for voxelwise dose calculation, *Med Phys, (in review)*, 2021.
7. Merrick M. J., Rotsch D. A., **Tiwari A.**, Nolen J., Brossard T., Song J., Wadas T. J., Sunderland J. J., and Graves S. A. Half-Life of ^{67}Cu, *J. Phys. Commun. 5 085007, 2021*.
6. **Tiwari A.**, Sunderland J., Graves S., Strand S., and Flynn R. Absorbed dose distributions from beta-decaying radionuclides: experimental validation of Monte Carlo tools for radiopharmaceutical dosimetry. *Med Phys*, 47(11):5779-5790, 2020.
5. Merrick M. J., Rotsch D. A., **Tiwari A.**, Nolen J., Brossard T., Song J., Wadas T. J., Sunderland J. J., and Graves S. A. Imaging and Dosimetric Characteristics of ^{67}Cu. *Phys Med Biol* 66, 035002, 2021.
4. **Tiwari A.**, Graves S., and Sunderland J. The Impact of Tissue Type and Density on Dose Point Kernels for Patient-Specific Voxel-Wise Dosimetry: A Monte Carlo Investigation. *Radiat Res* (2020) 193 (6): 531–542.
3. Zhang C., Mei D.-M., **Tiwari A**., and Cushman P. Reply to "Comment of 'Observation of annual modulation induced by γ rays from (α, γ) reactions at the Soudan Underground Laboratory'", *Phys Rev C* 101, 049802, 2020.
2. **Tiwari A.**, Zhang C., Mei D.-M., and Cushman P. Observation of annual modulation induced by γ rays from (α, γ) reactions at the Soudan Underground Laboratory, *Phys Rev C*, Vol. 96, No. 4, (2017).
1. **Tiwari A.,** and Khanal U., Gravitational radiation from a particle in bound orbit around the black hole; relativistic correction. *IOP Science Journal*, (2016).

INVITED AND RECENT TALKS

3. Simulations of therapeutic alpha-emitting radionuclides in various tissues. **Tiwari A.** and Sunderland J., OpenGATE Virtual Meeting, Nov 18, (2021).
2. GATE simulation of Discovery MI PET scanner and its extended version. **Tiwari A.** and Sunderland J., GATE Scientific Meeting, Virtual Edition, May 10, (2021).
1. Dosimetry of therapeutic beta emitters using GATE Monte Carlo simulation and its experimental validation for radiopharmaceutical therapy. **Tiwari A.**, GATE Technical Meeting, Virtual Edition, Sep 10 (2020).

CONFERENCE PRESENTATIONS AND ABSTRACTS (Peer reviewed)

15. Evaluation of therapeutic alpha emitters for their potential to be used in FAPI compounds, **Tiwari A.**, Graves S., Merrick MJ., and Sunderland J. (SNMMI Annual Meeting 2022).
14. Longitudinal PET/CT Imaging of ^{64}Cu for Radiopharmaceutical Therapy Dosimetry. Merrick M., Dunnwald L., **Tiwari A**., Sunderland J., and Graves S. (AAPM Annual Meeting 2021).
13. A Comprehensive PET-CT scanner characterization performance assessment paradigm and database. Sunderland J. and **Tiwari A.**, Journal of Nuclear Medicine, May 2021, 62 (supplement 1) 1398, (SNMMI Annual meeting, 2021).
12. Evaluation of a scalable qSPECT calibration method for radiopharmaceutical dosimetry. Graves S., Merrick M., **Tiwari A.,** and Sunderland J., Journal of Nuclear Medicine, May 2021, 62 (supplement 1) 143, (SNMMI Annual meeting, 2021).
11. Monte Carlo simulation of 4-ring Discovery MI PET/CT scanner and its extended axial field-of-view to 2 m. **Tiwari A.**, Merrick M. J., Graves S. A., and Sunderland J., Journal of Nuclear Medicine May 2021, 62 (supplement 1) 1150, (SNMMI Annual Meeting, 2021).
10. Experimental validation of Monte Carlo-generated beta absorbed doses for 3D voxelwise dosimetry. **Tiwari A.**, Graves S., Strand S. and Sunderland J., Journal of Nuclear Medicine May 2020, 61 (supplement 1) 533, (SNMMI Annual Meeting 2020).
9. Monte Carlo validation of convolution-based voxelwise dosimetry. Graves S., **Tiwari A.**, Kruzer A., Nelson A., Mirando D., Dewaraja Y., and Sunderland J., Journal of Nuclear Medicine May 2020, 61 (supplement 1) 1019, (SNMMI Annual Meeting 2020).
8. Collapsed-cone convolution superposition for improved accuracy of voxelwise dosimetry. Graves S., **Tiwari A.**, and Sunderland J., Journal of Nuclear Medicine May 2020, 61 (supplement 1) 535, (SNMMI Annual Meeting 2020).
7. Production, SPECT Imaging, and Initial Evaluation of 67Cu for Theranostic Applications. Merrick M. J., Rotsch D., **Tiwari A.**, Nolen J., Brossard T., Song J., Wadas T. J., Sunderland J. J., Graves S. A., (AAPM Annual Meeting, 2020).
6. Measurements of dose point kernels using GATE Monte Carlo toolkit for personalized convolution dosimetry. **Tiwari A.**, Graves S., Sunderland J., Journal of Nuclear Medicine 60 (supplement 1), 274-274, (SNMMI Annual Meeting, 2019), Anaheim, California, USA.
5. Impact of Kernel Truncation On ^{177}Lu-DOTATATE and 131I-MIBG Voxelwise Dosimetry. Graves S., **Tiwari A.**, Hyer D., Flynn R., Buatti J., Sunderland J., MEDICAL PHYSICS 46 (6), E316-E316, (AAPM Annual Meeting, 2019).
4. Toward best practice voxel-wise ^{177}Lu dosimetry: kernel generation, scanner characterization, and convolution-based dose calculation. Graves S., **Tiwari A.,** Menda Y., Madsen M., Sunderland J., Journal of Nuclear Medicine 60 (supplement 1), 119, (SNMMI Annual Meeting, 2019), California, USA.
3. The study of the correlation between (alpha, gamma) induced events with respect to Radon annual modulation. **Tiwari A.**, Zhang C. and Mei D. M., (APS Meeting, 2017), Washington DC, USA.
2. (alpha, gamma) reaction induced background events for rare event experiments. **Tiwari A.**, Zhang C., and Mei D. M, (APS Division of Nuclear Physics Meeting, 2016), Vancouver, Canada.
1. Gravitational radiation from a particle in bound orbit around black hole; relativistic correction. **Tiwari A.** and Khanal U, (11th Edorado Amaldi Conference on Gravitational Waves, 2015), Gwangju, South Korea.

PROFESSIONAL MEMBERSHIPS

- *Associate Member* - Society of Nuclear Medicine and Molecular Imaging (SNMMI) [2017 - 2022]
- *Student Member* - American Association of Physicist in Medicine (AAPM) [2019 -]
- *Student Member* - Golden Key International Honour Society [2017 - 2022]

EXPERTISE AND COMPUTING SKILLS

- High-Performance Computing (research computing, big data handling)
- Confident in the use of various operating systems: Linux, Windows, MacOS
- Programming and software skills
    - Monte Carlo Simulation: Geant4 Toolkit, GATE platform
    - ROOT data analysis framework
    - Programming: MATLAB, Python, C++
    - Interactive computing: Jupyter Notebook (Pandas, Numpy, Matplotlib, Scipy)
    - Deep Learning (Keras, Tensorflow)
    - Image reconstruction software: STIR, CASToR
    - Image analysis tools: ITK-SNAP, ImageJ, Amide, 3D Slicer and DICOM
    - JSON
    - Qt widget toolkit
    - Github, DOCKER
    - AutoCAD modeling
- Operation of clinical PET/CT scanners (Discovery MI, Siemens Vision and Biograph mCT)
    - Phantom scan for research
    - Phantom scan for PET/CT QA/QC
- Experience with careful handling of radioactive sources and dose calibrator
    - ^{90}Y, ^{177}Lu for absorbed dose measurements
    - ^{18}F, ^{89}Zr, ^{68}Ga for PET imaging

JOURNAL REVIEWER

- Medical Physics

LEADERSHIP ROLES

- Vice President, Nepalese Student Association, University of Iowa [2017 – 2021]