



Lawrie Skinner

Clinical Assistant Professor, Radiation Oncology - Radiation Physics

Bio

BIO

Dr Skinner is a Board certified therapeutic medical physicist with interests in novel 3D printed devices and a research background in synchrotron x-ray scattering, neutron scattering, molecular dynamics and Monte Carlo computational modelling.

ACADEMIC APPOINTMENTS

- Clinical Assistant Professor, Radiation Oncology - Radiation Physics

ADMINISTRATIVE APPOINTMENTS

- Postdoc, UC Berkeley, (2009-2009)
- Postdoc, Stony Brook university / Argonne Nat. Lab., (2010-2012)
- Research Assistant Professor, Stony Brook University /Argonne Nat. Lab., (2012-2015)
- Chief Physics Resident, Stanford University, (2018-2018)
- AAPM Northern California, Chapter Secretary, (2019- present)

PROFESSIONAL EDUCATION

- Residency, Stanford University , Therapeutic Medical Physics (2018)
- Pg. Cert., University of Chicago , Medical Physics (CAMPEP) (2016)
- PhD, Bristol University (UK) , Physics (condensed matter) (2009)
- MSci, Bristol University (UK) , Physics (2005)

PATENTS

- Lawrie Skinner. "United States Patent S19-067/PROV -- ID:3935 Tungsten filled 3D printed field shaping devices for electron beam radiation therapy", Leland Stanford Junior University, Aug 10, 2019
- Lawrie Skinner. "United States Patent PID:26564 A NOVEL INTEGRATED MULTI-MODAL PHANTOM FOR COMBINED DOSIMETRY AND POSITIONING VERIFICATION", Leland Stanford Junior University, Nov 19, 2018

Publications

PUBLICATIONS

- **A clinical solution for non-toxic 3D-printed photon blocks in external beam radiation therapy.** *Journal of applied clinical medical physics*
Schulz, J. B., Dubrowski, P., Gibson, C., Yu, A. S., Skinner, L. B.
2024: e14225
- **Exploring deep learning for estimating the isoeffective dose of FLASH irradiation from mouse intestinal histology images.** *International journal of radiation oncology, biology, physics*

- Fu, J., Yang, Z., Melemenidis, S., Viswanathan, V., Dutt, S., Manjappa, R., Lau, B., Soto, L. A., Ashraf, R., Skinner, L., Yu, S. J., Surucu, M., Casey, et al
2024
- **Automating the Treatment Planning Process for Volumetric Modulated Arc Therapy Craniospinal Irradiation (VMAT-CSI).** *Practical radiation oncology*
Romero, I. O., Simiele, E. A., Lozko, Y., Severyn, Y., Skinner, L. B., Yang, Y., Wang, J. Y., Xing, L., Gibbs, I., Hiniker, S. M., Kovalchuk, N.
2023
 - **Tungsten filled 3D printed lung blocks for total body irradiation.** *Practical radiation oncology*
Capaldi, D. P., Gibson, C., Villa, A., Schulz, J. B., Ziemer, B. P., Fu, J., Dubrowski, P., Yu, A. S., Fogh, S., Chew, J., Boreta, L., Braunstein, S. E., Witztum, et al
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 - **FLASH-RT does not affect chromosome translocations and junction structures beyond that of CONV-RT dose-rates.** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*
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2023: 109906
 - **Shaping success: clinical implementation of a 3D-printed electron cutout program in external beam radiation therapy.** *Frontiers in oncology*
Schulz, J. B., Gibson, C., Dubrowski, P., Marquez, C. M., Million, L., Qian, Y., Skinner, L., Yu, A. S.
2023; 13: 1237037
 - **An Integrated 3D Printed Enclosure for a Radioluminescent-Based Phantom for Quality Assurance on a Robotic-Arm Linac.** *Physics in medicine and biology*
Ashraf, M. R., Gibson, C., Skinner, L. B., Gu, X., Xing, L., Wang, L.
2023
 - **Clinical LINAC-based electron FLASH: Pathway for practical translation to FLASH clinical trials: LINAC electron FLASH.** *International journal of radiation oncology, biology, physics*
No, H. J., Wu, Y. F., Dworkin, M. L., Manjappa, R., Skinner, L., Ashraf, M. R., Lau, B., Melemenidis, S., Viswanathan, V., Yu, A. S., Surucu, M., Schüler, E., Graves, et al
2023
 - **3D printing in brachytherapy: A systematic review of gynecological applications.** *Brachytherapy*
Fahimian, B. P., Liu, W., Skinner, L., Yu, A. S., Phillips, T., Steers, J. M., DeMarco, J., Fraass, B. A., Kamrava, M.
2023
 - **Feasibility of the Audio-Visual Assisted Therapeutic Ambience in Radiotherapy (AVATAR) system for anesthesia avoidance in pediatric patients: A multicenter trial.** *International journal of radiation oncology, biology, physics*
Gutkin, P. M., Skinner, L., Jiang, A., Donaldson, S. S., Loo, B. W., Oh, J., Wang, Y. P., von Eyben, R., Snyder, J., Bredfeldt, J. S., Breneman, J. C., Constine, L. S., Faught, et al
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 - **FLASH-RT does not affect chromosome translocations and junction structures beyond that of CONV-RT dose-rates.** *bioRxiv : the preprint server for biology*
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 - **Mitigation of IMRT/SBRT treatment planning errors on the RefleXion X1 system using FMEA within Six Sigma framework** *Advances in Radiation Oncology*
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2023
 - **Dosimetric Predictors of Local Control after Stereotactic Ablative Radiotherapy (SABR) for Lung Tumors: A Secondary Analysis of a Phase II Prospective Trial of Individualized SABR (iSABR)**
Wu, Y., Lau, B., Fu, J., Skinner, L., Gensheimer, M., Gee, H., Diehn, M., Loo, B., Chin, A., Vitzthum, L.
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 - **Design and validation of a dosimetric comparison scheme tailored for ultra-high dose-rate electron beams to support multicenter FLASH preclinical studies.** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*
Gonçalves Jorge, P., Melemenidis, S., Grilj, V., Buchillier, T., Manjappa, R., Viswanathan, V., Gondré, M., Vozenin, M. C., Germond, J. F., Bochud, F., Moeckli, R., Limoli, C., Skinner, et al

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- **The Stanford VMAT TBI Technique.** *Practical radiation oncology*
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2022
- **Radiation Therapy without Anesthesia for a 2-Year Old Child using Audio-Visual Assisted Therapeutic Ambience in Radiotherapy (AVATAR).** *Practical radiation oncology*
Prasad, R. N., Baliga, S., Banner, J., Cadieux, C., Centnar, A., Degnan, M., Depinet, M., Ewing, A., Hobbs, N., Jiang, A. L., Manring, I., Perlow, H. K., Rock, et al
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- **Technical report: 3D-printed patient-specific scalp shield for hair preservation in total skin electron beam therapy.** *Technical innovations & patient support in radiation oncology*
Rahimy, E., Skinner, L., Kim, Y. H., Hoppe, R. T.
2021; 18: 12-15
- **CT-less electron radiotherapy simulation and planning with a consumer 3D camera.** *Journal of applied clinical medical physics*
Skinner, L., Knopp, R., Wang, Y., Dubrowski, P., Bush, K. K., Limmer, A., Trakul, N., Million, L., Marquez, C. M., Yu, A. S.
2021
- **Radiation Therapy for Primary Cutaneous Gamma Delta Lymphoma Prior to Stem Cell Transplantation.** *Cancer investigation*
Wu, Y. F., Skinner, L., Lewis, J., Khodadoust, M. S., Kim, Y. H., Kwong, B. Y., Weng, W., Hoppe, R. T., Sodji, Q., Hui, C., Kastelowitz, N., Fernandez-Pol, S., Hiniker, et al
2021: 1–11
- **Use of Audiovisual Assisted Therapeutic Ambience in Radiotherapy (AVATAR) for Anesthesia Avoidance in a Pediatric Patient With Down Syndrome.** *Advances in radiation oncology*
Gutkin, P. M., Donaldson, S. S., Skinner, L., Callejas, M., Cimino, J., Lore, J., Bush, K., Hiniker, S. M.
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- **A robotically assisted 3D printed quality assurance lung phantom for Calypso.** *Physics in medicine and biology*
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Breitkreutz, D. Y., Skinner, L., Lo, S., Yu, A.
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- **Deep learning-augmented radiotherapy visualization with a cylindrical radioluminescence system.** *Physics in medicine and biology*
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- **Precision radiotherapy using monochromatic inverse Compton x-ray sources.** *Medical physics*
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- **Second window near-infrared dosimeter (NIR2D) system for radiation dosimetry.** *Physics in medicine and biology*
Kim, T. J., Cheng, K., Zhang, H., Liu, S., Skinner, L., Xing, L.
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- **FLASH irradiation enhances the therapeutic index of abdominal radiotherapy in mice**
Natarajan, S., Levy, K., Wang, J., Chow, S., Eggold, J., Loo, P., Manjappa, R., Lartey, F. M., Schuler, E., Skinner, L., Rafat, M., Ko, R., Kim, et al
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- **Intensity modulated Ir-192 brachytherapy using high-Z 3D printed applicators.** *Physics in medicine and biology*
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- **Impact of Audio-Visual Assisted Therapeutic Ambience in Radiotherapy (AVATAR) on Anesthesia Use, Payer Charges, and Treatment Time in Pediatric Patients.** *Practical radiation oncology*

- Balazy, K. E., Gutkin, P. M., Skinner, L., von Eyben, R., Fowler, T., Pinkham, D. W., Rodriguez, S., Maxim, P. G., Donaldson, S. S., Loo, B. W., Bush, K., Hiniker, S. M.
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- **Technical Note: Evaluation of Audiovisual Biofeedback Smartphone Application for Respiratory Monitoring in Radiation Oncology.** *Medical physics*
Capaldi, D. P., Nano, T. F., Zhang, H. n., Skinner, L. B., Xing, L. n.
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 - **FLASH Irradiation Results in Reduced Severe Skin Toxicity Compared to Conventional-Dose-Rate Irradiation.** *Radiation research*
Soto, L. A., Casey, K. M., Wang, J. n., Blaney, A. n., Manjappa, R. n., Breikreutz, D. n., Skinner, L. n., Dutt, S. n., Ko, R. B., Bush, K. n., Yu, A. S., Melemenidis, S. n., Strober, et al
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 - **A preliminary report of gonadal-sparing TBI using a VMAT technique.** *Practical radiation oncology*
Blomain, E. S., Kovalchuk, N. n., Neilsen, E. n., Skinner, L. n., Hoppe, R. T., Hiniker, S. M.
2020
 - **Patient motion tracking for non-isocentric and non-coplanar treatments via fixed frame-of-reference 3D camera.** *Journal of applied clinical medical physics*
Gasparyan, S. n., Ko, K. n., Skinner, L. B., Ko, R. B., Loo, B. W., Fahimian, B. P., Yu, A. S.
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 - **An integrated quality assurance phantom for frameless single-isocenter multitarget stereotactic radiosurgery.** *Physics in medicine and biology*
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 - **Abdominal FLASH irradiation reduces radiation-induced gastrointestinal toxicity for the treatment of ovarian cancer in mice.** *Scientific reports*
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2020; 10 (1): 21600
 - **Volumetric Modulated Arc Therapy and 3-Dimensional Printed Bolus in the Treatment of Refractory Primary Cutaneous Gamma Delta Lymphoma of the Bilateral Legs** *PRACTICAL RADIATION ONCOLOGY*
Obeid, J., Gutkin, P. M., Lewis, J., Skinner, L., Wang, E. B., Khodadoust, M. S., Kim, Y. H., Weng, W., Hoppe, R. T., Hiniker, S. M.
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 - **Tungsten filled 3D printed field shaping devices for electron beam radiation therapy.** *PloS one*
Skinner, L., Fahimian, B. P., Yu, A. S.
2019; 14 (6): e0217757
 - **Optimizing efficiency and safety in external beam radiotherapy using automated plan check (APC) tool and six sigma methodology.** *Journal of applied clinical medical physics*
Liu, S. n., Bush, K. K., Bertini, J. n., Fu, Y. n., Lewis, J. M., Pham, D. J., Yang, Y. n., Niedermayr, T. R., Skinner, L. n., Xing, L. n., Beadle, B. M., Hsu, A. n., Kovalchuk, et al
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 - **Factor 10 Expedience of Monthly Linac Quality Assurance via an Ion Chamber Array and Automation Scripts.** *Technology in cancer research & treatment*
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 - **Cost Analysis of Audiovisual-Assisted Therapeutic Ambiance in Radiation Therapy (AVATAR) Aided Omission of Anesthesia in Radiation for Pediatric Malignancies.** *Practical radiation oncology*
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 - **The temperature dependence of intermediate range oxygen-oxygen correlations in liquid water** *JOURNAL OF CHEMICAL PHYSICS*
Schlesinger, D., Wikfeldt, K. T., Skinner, L. B., Benmore, C. J., Nilsson, A., Pettersson, L. G.

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- **X-ray and Neutron Scattering of Water** *CHEMICAL REVIEWS*
Amann-Winkel, K., Bellissent-Funel, M., Bove, L. E., Loerting, T., Nilsson, A., Paciaroni, A., Schlesinger, D., Skinner, L.
2016; 116 (13): 7570-7589
- **Low-Dimensional Network Formation in Molten Sodium Carbonate** *SCIENTIFIC REPORTS*
Wilding, M. C., Wilson, M., Alderman, O. G., Benmore, C., Weber, J. R., Parise, J. B., Tamalonis, A., Skinner, L.
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- **Exploring the structure of high temperature, iron-bearing liquids**
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- **Molten uranium dioxide structure and dynamics** *SCIENCE*
Skinner, L. B., Benmore, C. J., Weber, J. R., Williamson, M. A., Tamalonis, A., Hebden, A., Wiencek, T., Alderman, O. G., Guthrie, M., Leibowitz, L., Parise, J. B.
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- **Structure of Ba-Ti-Al-O glasses produced by aerodynamic levitation and laser heating** *PHYSICAL REVIEW B*
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- **Ultrafast X-ray probing of water structure below the homogeneous ice nucleation temperature** *NATURE*
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- **Benchmark oxygen-oxygen pair-distribution function of ambient water from x-ray diffraction measurements with a wide Q-range** *JOURNAL OF CHEMICAL PHYSICS*
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- **Joint diffraction and modeling approach to the structure of liquid alumina** *PHYSICAL REVIEW B*
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