

Fecha del CVA	31/03/2025
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Parte A. DATOS PERSONALES

Nombre	Joaquin		
Apellidos	Lopez Herraiz		
Sexo	Hombre	Fecha de Nacimiento	
DNI/NIE/Pasaporte			
URL Web			
Dirección Email			
Open Researcher and Contributor ID (ORCID)	0000-0001-7208-8863		

A.1. Situación profesional actual

Puesto	Profesor Titular de Universidad		
Fecha inicio	2021		
Organismo / Institución	Universidad Complutense de Madrid (UCM)		
Departamento / Centro	Dpto. EMFTEL / Facultad de Ciencias Fisicas / IPARCOS		
País	España	Teléfono	
Palabras clave	Medicina nuclear; Instrumentacion fisica en biomedicina; Equipo médico		

A.2. Situación profesional anterior (incluye interrupciones en la carrera investigadora - indicar meses totales, según texto convocatoria-)

Periodo	Puesto / Institución / País
2018 - 2021	Profesor Contratado Doctor / UCM
2017 - 2018	Investigador Contratado con Cargo a Proyecto / UCM
2014 - 2017	Investigador Marie-Curie COFUND / UCM
2011 - 2014	Becario Postdoctoral / Massachusetts Institute of Technology (MIT) / Estados Unidos de América
2010 - 2011	Becario Postdoctoral / UCM / España
2008 - 2010	Becario Predoctoral / UCM / España

A.3. Formación académica

Grado/Master/Tesis	Universidad / País	Año
Doctor en Ciencias Físicas	UCM / España	2010
Máster Universitario en Física Biomédica	UCM / España	2008
Licenciado en Ciencias Físicas	UCM / España	2003

Parte B. RESUMEN DEL CV

Associate Professor at Faculty of Physics of the Universidad Complutense de Madrid. He obtained his PhD in Nuclear Physics in 2010 at UCM, where he continued with a postdoctoral contract until June 2011, when he obtained a grant from the Madrid-MIT m+Vision Consortium to design and lead 2 innovative medical imaging projects from MIT (Boston, MA, USA) with a total budget of more than \$500k which led to 4 PCT patents, 8 publications and 2 NIH (USA) grants. After 4 years at MIT, he obtained in 2014 a Marie-Curie Cofund fellowship at UCM, where in 2018 he obtained a position as "Profesor Contratado Doctor interino" and in 2021 as "Profesor Titular" (Associate Professor as Civil Servant). He has 3 "Sexenios de Investigación" from CNEAI (the last one from 2018-2024).

He has co-authored 56 papers (77% in T1; 14% in D1), and more than 65 conference proceedings in the main nuclear physics and medical physics journals, mostly as first, second or last author. His publications have been cited 1526 times according to Scopus (H-index: 19) and 2548 times according to Google scholar (H-index: 24). He has reviewed 69 articles (Publons) and he is currently guest and topic editor of Applied Sciences (IF 2.47). He has co-supervised 11 PhD Thesis and 29 Master Thesis. He has been teaching at bachelor and master levels at

UCM since 2005, with more than 1000 teaching hours, including several courses of the Master of medical physics of the National University of Costa Rica. He is the director of an international summer school at UCM ("Imagen Médica y Protonterapia") and the international winter school at UCM "Applications of Artificial Intelligence in Science". In 2019 he co-organized the first IPARCOS Workshop "Machine Learning and Applications to Physics" at UCM with almost 100 attendees.

He has participated in more than 50 conferences, with many oral presentations and invited talks. He had an invited talk at the Annual Congress of the European Association of Nuclear Medicine 2016, as he was recognized as one of the 3 best presentations at the European Molecular Imaging Meeting 2016. He has been part of 10 regional and national research projects, and 4 international ones (being co-PI in two of them). In collaboration with the Memorial Sloan Kettering Cancer Center of New York, he participated in a 5-year NIH grant (USA), and since 2020 he also participated in another NIH grant to develop a PET scanner for brain imaging with the Massachusetts General Hospital (Boston, MA, USA). In 2019, he received a "Retos investigación" project from MICINN as PI.

He was the main developer of the PET image reconstruction software FIRST, licensed to the Spanish company Suinsa and distributed worldwide by General Electric, and the Ultrasound image reconstruction software SoSTIR, licensed to the German company iThera in 2019. He also has 4 USA granted patents in PET and Ultrasound imaging, which are in the process of being licensed. In 2020 he lead the X-COV project, to help radiologists with the analysis of Chest X-ray of COVID-19 patients, which was awarded as the master winner of the worldwide UNESCO Hackathon CodeTheCurve. He collaborated in the creation of the Boston division of the Association of Spanish Scientists in USA (ECUSA-Boston), and the International Mentor Program (IMP). As the current director of IMP-Engineering, he is coordinating 37 international mentors from the most prestigious research centers in the world.

Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES

C.1. Publicaciones más importantes en libros y revistas con "peer review" y conferencias

AC: Autor de correspondencia; (nº x / nº y): posición firma solicitante / total autores. Si aplica, indique el número de citaciones

- 1 **Artículo científico.** Elena Mercep; (2/4) Joaquin L. Herraiz; Xosé Luís Deán-Ben; Daniel Razansky. 2019. Transmission–reflection optoacoustic ultrasound (TROPUS) computed tomography of small animals. Light: Science & Applications. Nature Research. 8-18. ISSN 2047-7538.
- 2 **Artículo científico.** Angel Torrado Carvajal; Yigitcan Eryaman; Esra Abaci Turk; Joaquin Lopez Herraiz; Juan A Hernandez Tamames; Elfar Adalsteinsson; Lawrence L. Wald; Norberto Malpic. 2018. Computer-Vision Techniques for Water-Fat Separation in Ultra High-Field MRI Local Specific Absorption Rate Estimation. IEEE Transactions in Biomedical Engineering. IEEE. 00-00.
- 3 **Artículo científico.** Cal-Gonzalez, Jacobo; Vaquero, Juan J; (3/8) Herraiz, Joaquin L; Maily Perez-Liva; Ma Luisa Soto-montenegro; Santiago Peña; Desco, Manuel; Udias, Jose M. 2018. Improving PET Quantification of Small Animal ⁶⁸GaDOTA-Labeled PET/CT Studies by Using a CT-Based Positron Range Correnction. Molecular Imaging and Biology. Springer. 20-4, pp.584-593. ISSN 1536-1632.
- 4 **Artículo científico.** Maria Sorian-Carot; Rosa Breton-Romero; (3/13) Herraiz, Joaquin L; et al; Zafira Castano. 2017. International Mentoring as a New Educational Approach to Alleviate Brain Drain, Empower Young Talent, and Internationalize Higher Education. Nature Biotechnology. Nature Publishing Group. 35-3, pp.285-288. ISSN 1087-0156. <https://doi.org/10.1038/nbt.3822>
- 5 **Artículo científico.** KM Abushab; (2/8) Herraiz, Joaquin L; Esther Vicente Torrico; Cal-Gonzalez, Jacobo; Samuel España; Vaquero, Juan J; Bjorn W Jakoby; Udias, Jose M. 2016. Evaluation of PeneloPET Simulations of Biograph PET/CT Scanners. IEEE Transactions on Nuclear Science. IEEE. 63-3, pp.1367-1374. ISSN 0018-9499.

- 6 **Artículo científico.** Fraile, LM; (2/11) Herraiz, JL; Udias, Jose Manuel; et al; others. 2016. Experimental validation of gallium production and isotope-dependent positron range correction in PET. Nuclear Instruments and Methods in Physics Research Section A. Elsevier. 814, pp.110-116. ISSN 0168-9002.
- 7 **Artículo científico.** Angel Torrado; (2/8) Herraiz, Joaquin L; Eduardo Alcain; Antonio S Montemayor; Lina Garcia-Cañamaque; Juan A Hernandez-Tamames; Yves Rozenholc; Norberto Malpica. 2016. Fast patch-based pseudo-CT synthesis from T1-weighted MR images for PET/MR attenuation correction in brain studies. Journal of Nuclear Medicine. Society of Nuclear Medicine. 57-1, pp.136-143. ISSN 0161-5505.
- 8 **Artículo científico.** Nesrin Mansouri; Daniel Balvay; Omar Zenteno; et al; Mailyn Perez-Liva. 2023. Machine Learning of Multi-Modal Tumor Imaging Reveals Trajectories of Response to Precision Treatment. Cancers. MDPI. 15-6, pp.1751.
- 9 **Artículo científico.** Fernando Arias-Valcayo; Pablo Galve; Jose M. Udias; Juan José Vaquero; Manuel Desco; Joaquin L. Herraiz. 2023. Optimizing Point Source Tracking in Awake Rat PET Imaging: A Comprehensive Study of Motion Detection and Best Correction Conditions. Applied Sciences. MDPI. 13-22, pp.12329.
- 10 **Artículo científico.** Fernando Arias-Valcayo; Pablo Galve; Joaquin L. Herraiz; Juan José Vaquero; Manuel Desco; Jose M. Udias. 2023. Reconstruction of multi-animal PET acquisitions with anisotropically variant PSF. Biomedical Physics & Engineering Express. IOP Science. 9, pp.065018.
- 11 **Artículo científico.** Clara Freijo; Joaquin L. Herraiz; Fernando Arias-Valcayo; Paula Ibañez; Gabriela Moreno; Amaia Villa-Abaunza; Jose M. Udias. 2023. Robustness of Single- and Dual-Energy Deep-Learning-Based Scatter Correction Models on Simulated and Real Chest X-rays. Algorithms. MDPI. 16-12, pp.565.
- 12 **Artículo científico.** Edwin C. Pratt; Alejandro Lopez-Montes; Alessia Volpe; et al; Joaquin L. Herraiz. 2023. Simultaneous quantitative imaging of two PET radiotracers via the detection of positron–electron annihilation and prompt gamma emissions. Nature Biomedical Engineering. Nature Publishing Group. 7, pp.1028-1039.
- 13 **Artículo científico.** Ober Van Gomez; Joaquin L. Herraiz; Jose Manuel Udias; Alexander Haug; Laszlo Papp; Dania Cioni; Emanuele Neri. 2022. Analysis of cross-combinations of feature selection and machine-learning classification methods based on [18F]F-FDG PET/CT radiomic features for prediction of metabolic response of individual lesions in metastatic breast cancer. Cancers. MDPI. 14-12, pp.2922.
- 14 **Artículo científico.** Jorge Camacho; Mario Muñoz; Vicente Genovés; et al; Yale Tung-Chen. 2022. Artificial Intelligence and democratization of the use of lung ultrasound in COVID-19: on the feasibility of automatic calculation of lung ultrasound score. International Journal of Translational Medicine. MDPI. 2-1, pp.17-25.
- 15 **Artículo científico.** (1/3) Joaquin L. Herraiz (AC); Adrián Bembibre; Alejandro López-Montes. 2021. Deep-Learning Based Positron Range Correction of PET Images. Applied Sciences. MDPI. 11-1, pp.266. ISSN 2076-3417. <https://doi.org/10.3390/app11010266>
- 16 **Artículo científico.** Clara Freijo; Joaquin L. Herraiz; Daniel Sanchez-Parceirsa; Jose Manuel Udias. 2021. Dictionary-based protoacoustic dose map imaging for proton range verification. Photoacoustics. Elsevier. 21, pp.100240.
- 17 **Artículo científico.** Brekan Lafci; Elena Mercep; Joaquin L. Herraiz; Xosé Luis Deán-Ben; Daniel Razansky. 2020. Noninvasive multiparametric characterization of mammary tumors with transmission-reflection optoacoustic ultrasound. Neoplasia. Elsevier. 22-12, pp.770-777.
- 18 **Artículo científico.** Alejandro López-Montes; Pablo Galve; Jose Manuel Udías; Jacobo Cal-Gonzalez; Juan José Vaquero; Manuel Desco; (7/7) Joaquin L. Herraiz (AC). 2020. Real-Time 3D PET Image with Pseudoinverse Reconstruction. Applied Sciences. MDPI. 10-8, pp.2829. ISSN 2076-3417.
- 19 **Artículo científico.** Mailyn Perez-Liva; Thulaciga Yoganathan; (3/9) Joaquin L. Herraiz; et al; Bertrand Tavitian. 2020. Ultrafast Ultrasound Imaging for Super-Resolution Preclinical Cardiac PET. Molecular Imaging and Biology. Springer. 22, pp.1342-1352. ISSN 1536-1632. <https://doi.org/10.1007/s11307-020-01512-w>

C.3. Proyectos o líneas de investigación

- 1 **Proyecto.** Multicolor PET to interrogate cancer biology. National Institute of Health (NIH) (EEUU). Jan Grimm. (MSKCC (New York, EEUU) & UCM (Madrid, Spain)). 01/05/2023-01/05/2027.
- 2 **Proyecto.** FAScIntillators for Nuclear structure and Applications (FASCINA). Luis Mario Fraile Prieto. (Universidad Complutense de Madrid). 01/10/2022-30/09/2025. 198.198 €.
- 3 **Proyecto.** TARTAGLIA - RED FEDERADA DE INTELIGENCIA ARTIFICIAL PARA ACELERAR LA INVESTIGACIÓN SANITARIA. Joaquin Lopez Herraiz. (Universidad Complutense de Madrid). 01/10/2021-31/12/2024. 300.000 €.
- 4 **Proyecto.** Plataforma de Gemelo Digital basado en Inteligencia Artificial para Protonterapia (PROTOTWIN). (Universidad Complutense de Madrid). 01/12/2022-31/12/2023. 314.000 €.
- 5 **Proyecto.** Software para el Uso de Coincidencias Triples en Tomografía por Emisión de Positrones (3PET). (Universidad Complutense de Madrid). 01/12/2022-31/12/2023. 103.500 €.
- 6 **Proyecto.** Nueva generación de equipos de imagen por rayos X con contraste de fase y fuente LÁSER (XPHASE-LASER). Ministerio de Ciencia e Innovación - Retos Colaboración. (Universidad Complutense de Madrid). 01/01/2020-31/12/2022. 592.000 €.
- 7 **Proyecto.** SISTEMA ULTRASÓNICO MULTIMODAL PARA IMAGEN DE MAMA (SUMIM). Jorge Camacho. (Universidad Complutense de Madrid). 01/01/2020-31/12/2021.
- 8 **Proyecto.** DESARROLLO DE TECNICAS DE IMAGEN MOLECULAR MULTITRAZADOR MULTIMODAL. MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES. Joaquin Lopez Herraiz. (Universidad Complutense de Madrid). 01/01/2019-31/12/2021. 29.040 €.
- 9 **Proyecto.** UBID: ULTRASOUND BREAST IMAGING WITH DEEP LEARNING. Lluís Guasch. (Universidad Complutense de Madrid). 21/05/2019-20/05/2020. 100.000 €.
- 10 **Proyecto.** TOPUS: Tomografía por Emisión de Positrones y Ultrasonidos. Jose Manuel Udias Moinelo. (Universidad Complutense de Madrid). 01/01/2016-31/12/2019. Miembro de equipo. DESARROLLO DE METODOS DE RECONSTRUCCION TOMOGRAFICA DE ULTRASONIDOS
- 11 **Contrato.** ULTRACOV: Ecografo orientado a la detección temprana y el seguimiento de la enfermedad COVID-19 Centro para el Desarrollo Tecnológico Industrial. 02/10/2020-02/10/2022. 35.000 €.
- 12 **Contrato.** Smart and self-reporting clinical nanocarriers for drug delivery National Institute of Health (NIH). Jan Grimm. 01/03/2017-01/03/2022. 120.000 €.
- 13 **Contrato.** 3D assessment of airway liquid absorption and muco-ciliary transport: key markers of lung disease pathophysiology National Institute of Health (NIH). Jose Gabriel Venegas. 01/04/2015-01/04/2017. 400.000 €.

C.4. Actividades de transferencia de tecnología/conocimiento y explotación de resultados

- 1 Tavitian 1; Tanter; Perez Liva; Lopez Herraiz; Provost. US2021/0239863. Super resolution in positron emission tomography imaging using ultrafast ultrasound imaging Estados Unidos de América. 05/08/2021. Centre National de la Recherche Scientifique (CNRS).
- 2 J. L. Herraiz; E. Lage; V. Parot; S. R. Dave. PCT/US2014/043826. Normalization Correction for Multiple-Detection Enhanced Emission Tomography Estados Unidos de América. 31/12/2014. Massachusetts Institute of Technology (MIT).
- 3 J. L. Herraiz; E. Lage; S. R. Dave; V. Parot. PCT/U82014/045220. System and Method to Improve Image Quality of Emission Tomography when Using Advanced Radionuclides España. 02/07/2014. Massachusetts Institute of Technology (MIT).
- 4 J. L. Herraiz; E. Lage; S. R. Dave; V. Parot. PCT/US2013/068858. Inter-Detector Scatter Enhanced Emission Tomography Estados Unidos de América. 15/05/2014. Massachusetts Institute of Technology (MIT).
- 5 J. L. HERRAIZ; J. M. Udias; S. España; J. J. Vaquero. (FIRST) Fast Iterative Reconstruction Software for Tomography España. 08/10/2007. Sedecal Molecular Imaging.