

# Cristina Lois Gómez

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## Academic positions

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### Harvard Medical School & Massachusetts General Hospital

Boston, MA

Research Fellow in Radiology

*Jul. 2015–present*

- Responsible of PET imaging analysis in a clinical study to evaluate tau tracers as a potential biomarkers in Alzheimer’s Disease.
- Responsible of PET/MR imaging analysis in a clinical study to search for markers of disease and progression in Huntington’s Disease.
- Using PET/MR neuroimaging to explore and develop new concepts in healthy and diseased brain function.
- Collaborating with a multi-disciplinary team of radiochemists, neuroscientists, and clinical physicians.

### Massachusetts Institute of Technology

Cambridge, MA

“M+Vision” Research Fellow in Translational Biomedical Imaging

*Jul. 2012–present*

- Intensive training on identifying unmet clinical needs and designing solutions with high translational potential and marketability.
- Conducted interviews with key opinion leaders in oncology, neurology, psychiatry, and radiology.
- Responsible of PET/MR imaging in a clinical study to investigate the biological basis of the placebo effect in depression.
- Built and co-managed an international team of radiochemists, biologists, engineers, and physicians, working on the development of a new PET tracer for early assessment of treatment response in melanoma patients.
- Received \$414K in internal grant funding.
- Co-organized and taught a MIT IAP course on Biomedical Imaging.
- Mentored postdocs and advanced graduate students in the MIT IMPACT program.

### Hospital Clinic Barcelona

Barcelona, Spain

Postdoctoral Research Associate

*Jan. 2012– Jun. 2012*

- Evaluated the value of dual-time-point PET for prediction of treatment response in lung cancer patients.

### Imaging Science Institute of Tübingen

Tübingen, Germany

Visiting Scientist

*Feb. 2011– Jul. 2011*

- Analyzed the effect of MRI contrast agents on PET quantification for PET/MRI applications and demonstrated how to avoid potential artifacts that could impact clinical decisions.
- Evaluated artifacts caused by dental implants in PET/CT and PET/MR imaging.
- Worked in a highly collaborative multi-disciplinary team of physicians, MR and PET physicists, and computer engineers.

### Hospital Clinic Barcelona

Barcelona, Spain

Visiting Researcher

*3 months in 2009 and 2010*

- Compared the performance of GATE & PeneloPET in simulating a microPET scanner.

### University of Santiago de Compostela

Santiago de Compostela, Spain

“Ángeles Alvariño” Fellow

*Dec. 2008–Dec 2011*

- Designed and built an affordable preclinical SPECT system by reusing a clinical gamma-camera.
- Received 60K € in competitive, public grant funding as PI.

- Led a multi-disciplinary team of physicists, nuclear medicine physicians, and mechanical engineers.
- Trained and supervised a graduate student and a postdoc.
- Responsible of designing and teaching one undergraduate laboratory course and two graduate courses.

#### University of Tennessee Medical Center

Postdoctoral Research Associate

Knoxville, TN

*Feb. 2007– Jul. 2008*

- Working in collaboration with Siemens, demonstrated the benefits of incorporating time-of-flight information in PET/CT by carrying out a study on a large population of 100 oncology patients.
- Published two highly cited papers, one chosen as cover in *Journal of Nuclear Medicine*.

#### University of Santiago de Compostela

Postdoctoral Research Assistant

Santiago de Compostela, Spain

*Sep. 2006–Jan 2007*

- Measured the neutron fluency in a linear accelerator to estimate its contribution to the radiation dose in radiotherapy patients.

#### University of Zürich

Zürich, Switzerland

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#### University of Santiago de Compostela

Research & Teaching Assistant

Santiago de Compostela, Spain

*Sep. 2001–Jun. 2006*

- Contributed to the design and development and carried out performance studies of the silicon microstrip detectors installed in the Silicon Tracker of the LHCb experiment at CERN.
- Trained and supervised undergraduate students.

### Awards

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M+Vision Advanced Fellowship (declined), Madrid-MIT M+Vision Consortium *Aug. 2013*

M+Vision Fellowship

Madrid-MIT M+Vision Consortium

*Jul. 2012*

Ranked 2nd among more than 100 applicants.

“Best Oral Presentation in Nuclear Medicine”

Spanish Nuclear Society Annual Meeting

*Oct. 2010*

Front cover of the Journal of Nuclear Medicine, Vol. 50

Featuring results on “Impact of Time-of-Flight on PET Tumor Detection”.

*Aug. 2009*

José Castillejo Fellowship

Ministerio de Educación y Ciencia, Spain

*Sep. 2007–Jun. 2008*

Ángeles Alvariño Fellowship

Xunta de Galicia, Spain

*Dec. 2008–Dec. 2011*

Ranked 2nd among more than 200 applicants.

Predoctoral research grant

Universidad de Santiago de Compostela, Spain

*Oct. 2005–May 2006*

Excma. Diputación Provincial de A Coruña, Spain

*Jul. 2003–Jul. 2004*

Excma. Diputación Provincial de A Coruña, Spain

*Jul. 2002–Jul. 2003*

### Grants

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Treatment response in advanced melanoma patients

*Funding Agency:* Madrid-MIT M+Vision Consortium.

*Duration:* Feb. 2013–Dec. 2014.

*Budget:* \$414,473.

*Principal Investigators:* Osasere Evboumwan and Cristina Lois.

Development of a pinhole SPECT system based on a conventional gamma camera

*Funding Agency:* Xunta de Galicia, Spain.

*Duration:* Dec. 2009–Dec. 2011.

*Budget:* 60000 €.

*Principal Investigator:* Cristina Lois.

Development and evaluation of the next generation of high-performance PET Scanners

*Funding Agency:* Programa José Castillejo, Ministerio de Educación y Ciencia.

*Duration:* Jul. 2007–Jun. 2008.

*Budget:* 25000 €.

*Principal Investigator:* Cristina Lois.

## Education

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**PhD in Physics**, with European Doctorate

University of Santiago de Compostela

*Oct. 2001 - May 2006*

Santiago de Compostela, Spain

**MSc in Particle Physics & Non-linear Dynamics**

University of Santiago de Compostela

*Oct. 2001 - Sep. 2003*

Santiago de Compostela, Spain

**BSc in Physics**

University of Santiago de Compostela

*Oct. 1995 - Sept. 2001*

Santiago de Compostela, Spain

## Publications

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Authored 50+ scientific publications, 10+ as first or last author, and with a total of 3200+ citations.

See also my *Google Scholar* profile at [bit.ly/cloispubs](http://bit.ly/cloispubs).

- [1] FD Popota et al. “Monte Carlo simulations versus experimental measurements in a small animal PET system. A comparison in the NEMA NU 4-2008 framework”. In: *Physics in Medicine and Biology* 60.1 (2015), p. 151.
- [2] P Aguiar et al. “A portable device for small animal SPECT imaging in clinical gamma-cameras”. In: *Journal of Instrumentation* 9.07 (2014), P07004.
- [3] Osasere Evbuomwan et al. “Synthesis and evaluation of a radiolabeled stapled peptide for monitoring the apoptotic state of tumors”. In: *Journal of Nuclear Medicine* 55.Supplement 1 (2014), pp. 1043–1043.
- [4] P Aguiar et al. “A feasibility study on the use of arrays of discrete SiPMs for MR compatible LYSO readout using Monte Carlo simulation”. In: *Journal of Instrumentation* 7.06 (2012), P06002.
- [5] Pablo Aguiar and Cristina Lois. “Analytical study of the effect of the system geometry on photon sensitivity and depth of interaction of positron emission mammography”. In: *Journal of oncology* 2012 (2012).
- [6] Cristina Lois et al. “Effect of MR contrast agents on quantitative accuracy of PET in combined whole-body PET/MR imaging”. In: *European Journal of Nuclear Medicine and Molecular Imaging* 39.11 (2012), pp. 1756–1766.
- [7] P Aguilar et al. “New developments in molecular imaging: positron emission tomography time-of-flight (TOF-PET)”. In: *Nuclear Espana* (2011).
- [8] C Lois et al. “Noise Propagation in PET/CT through CT-based Attenuation Correction: Effects of Low-Dose CT Imaging”. In: *97th Scientific Assemble and Annual Meeting of the Radiological Society of North America (RSNA 2011)*. 2011.
- [9] C Lois et al. “Combined whole-body PET/MR imaging: MR contrast agents do not affect the quantitative accuracy of PET following attenuation correction”. In: *97th Scientific Assemble and Annual Meeting of the Radiological Society of North America (RSNA 2011)*. 2011.
- [10] C Lois et al. “Effect of MR contrast agents on quantitative accuracy of PET in combined whole-body PET/MR imaging”. In: *Annual Congress of the European Association of Nuclear Medicine (EANM)*. 2011.

- [11] H Schmidt et al. “First Results on Patients and Phantoms of a Fully Integrated Clinical Whole-Body PET/MRI”. In: *2011 IEEE Nuclear Science Symposium, Medical Imaging Conference*. 2011.
- [12] Pablo Aguiar et al. “Monte Carlo optimization of SiPM readout configurations for continuous LYSO blocks”. In: *Nuclear Science Symposium Conference Record (NSS/MIC)*. IEEE. 2010, pp. 3638–3640.
- [13] Cristina Lois et al. “Characterization of low energy Lu background on continuous LYSO blocks”. In: *Nuclear Science Symposium Conference Record (NSS/MIC)*. IEEE. 2010, pp. 1–3.
- [14] Cristina Lois et al. “An assessment of the impact of incorporating time-of-flight information into clinical PET/CT imaging”. In: *Journal of Nuclear Medicine* 51.2 (2010), pp. 237–245.
- [15] Dan J Kadrmas et al. “Impact of time-of-flight on PET tumor detection”. In: *Journal of Nuclear Medicine* 50.8 (2009), pp. 1315–1323.
- [16] FD Popota et al. “Comparison of NEMA NU 4-2008 vs NEMA NU 2-2001 for the performance evaluation of the microPET R4 system”. In: *Nuclear Science Symposium Conference Record (NSS/MIC)*. IEEE. 2009, pp. 2706–2709.
- [17] Pablo Aguiar et al. “Design simulations of a LSO crystal block detector module for dual PET/SPECT systems”. In: *Nuclear Science Symposium Conference Record, 2008*. IEEE. 2008, pp. 3829–3831.
- [18] AF Barbosa et al. “The LHCb Detector at the LHC”. In: *Journal of Instrumentation* 3.08 (2008), S08005.
- [19] Ralf Bernhard et al. “The LHCb silicon tracker”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 596.1 (2008), pp. 17–20.
- [20] M Conti et al. “Clinical evaluation of time-of-flight imaging”. In: *European Journal of Nuclear Medicine and Molecular Imaging*. Vol. 35. Springer 233 Spring St, New York, NY 10013 USA. 2008, S166–S166.
- [21] Maurizio Conti et al. “Assessment of the clinical potential of a time-of-flight PET/CT scanner with less than 600 ps timing resolution”. In: *Journal of Nuclear Medicine* 49.Supplement 1 (2008), 411P.
- [22] B Couce et al. “Parametrization of SiPM dynamic range contribution to energy resolution of scintillation light readout”. In: *Nuclear Science Symposium Conference Record*. IEEE. 2008, pp. 3973–3974.
- [23] Cristina Lois et al. “Physical and Clinical Evaluation of Standardized Uptake Values”. In: *APS Meeting Abstracts*. Vol. 1. 2008, p. 16004.
- [24] O Steinkamp et al. “Production and Quality Assurance of Detector Modules for the LHCb Silicon Tracker”. In: *10th ICATPP Conference on Astroparticle, Particle, Space Physics, Detectors and Medical Physics Applications*. 2008.
- [25] M Agari et al. *Radiation monitoring system for the LHCb Inner Tracker*. Tech. rep. CERN-LHCb-2007-062, 2007.
- [26] Olaf Steinkamp et al. “Design and production of detector modules for the LHCb Silicon Tracker”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 579.2 (2007), pp. 736–741.
- [27] Dmytro Volyanskyy et al. *Production and quality assurance of detector modules for the LHCb silicon tracker*. Tech. rep. CERN-LHCb-2007-131, 2007.
- [28] M Agari et al. “The lhcb silicon tracker project”. In: *Nuclear Physics B-Proceedings Supplements* 150 (2006), pp. 114–117.
- [29] S Kostner et al. “LHCb silicon tracker performance studies”. In: *IEEE Transactions on Nuclear Science* 53.4 (2006), pp. 2440–2445.
- [30] Cristina Lois. “Silicon sensor probing and radiation studies for the LHCb silicon tracker”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 568.1 (2006), pp. 277–283.
- [31] C Lois-Gómez and P) (Dir: Adeva-Andany B & Vázquez-Regueiro. “Study of Silicon Microstrip Detector Properties for the LHCb Silicon Tracker”. PhD thesis. CERN-THESIS; University of Santiago de Compostela, 2006.
- [32] Matthew Needham, LHCb Collaboration, et al. “Status and expected performance of the LHCb tracking system”. In: *Nuclear Physics B-Proceedings Supplements* 156.1 (2006), pp. 217–220.
- [33] Olaf Steinkamp et al. “Performance of long ladders for the LHCb silicon tracker”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 569.1 (2006), pp. 84–87.

- [34] K Vervink. “Design and performance of the LHCb Silicon Tracker”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 566.1 (2006), pp. 170–173.
- [35] B Adeva et al. “The LHCb silicon tracker”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 546.1 (2005), pp. 76–80.
- [36] M Agari et al. *A radiation tolerant fiber-optic readout system for the LHCb Silicon Tracker*. Tech. rep. CERN-LHCb-2005-032, 2005.
- [37] M Agari et al. *Measurements of a prototype ladder for the TT station in a 120 GeV/c  $\pi^-$  beam*. Tech. rep. CERN-LHCb-2004-103, 2005.
- [38] M Agari et al. *Performance of long ladders for the LHCb Silicon Tracker*. Tech. rep. CERN-LHCb-PROC-2005-041, 2005.
- [39] G Baumann et al. *Pre-series sensor qualification for the inner tracker of LHCb*. Tech. rep. CERN-LHCb-2005-037, 2005.
- [40] G Baumann et al. *Quality Assurance of 100 CMS2-OB2 Sensors*. Tech. rep. CERN-LHCb-2004-105, 2005.
- [41] A Bay et al. *Hybrid design, procurement and testing for the LHCb Silicon Tracker*. Tech. rep. CERN-LHCb-2005-065, 2005.
- [42] A Bay et al. “The LHCb silicon tracker”. In: *Nuclear instruments & methods in physics research. Section A, Accelerators, spectrometers, detectors and associated equipment* 546.1 (2005), pp. 76–80.
- [43] S Cadeddu et al. *LHCb computing*. CERN-LHCb-TDR-011, 2005.
- [44] F Lehner et al. *Mechanical and Thermal Characterisation of a TT Half-Module Prototype*. Tech. rep. CERN-LHCb-2005-007, 2005.
- [45] Olaf Steinkamp et al. “Silicon strip detectors for the LHCb experiment”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 541.1 (2005), pp. 83–88.
- [46] Achim Vollhardt et al. *Production of the LHCb silicon tracker readout electronics*. Tech. rep. CERN-LHCb-2005-064, 2005.
- [47] Helge Voss. “The LHCb silicon tracker”. In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 549.1-3 (2005), pp. 44–48.
- [48] B Adeva et al. “The silicon tracker of the LHCb experiment”. In: *Nuclear Science Symposium Conference Record*. Vol. 2. IEEE. 2004, pp. 1179–1182.
- [49] M Agari et al. *Test-beam measurements on prototype ladders for the LHCb TT station and Inner Tracker*. Tech. rep. CERN-LHCb-2003-082, 2004.
- [50] R Bernhard et al. *Measurements of prototype ladders for the silicon tracker with a laser*. Tech. rep. CERN-LHCb-2004-102, 2004.
- [51] Cristina Lois Gomez, Universidade de Santiago de Compostela. Facultade de Física, and Universidade de Santiago de Compostela. Departamento de Física de Partículas. *Signal and Noise Performance of a Prototype Silicon Microstrip Detector for the LHCb Silicon Tracker*. 2004.
- [52] S Koestner et al. “The Silicon Tracker of the LHCb Experiment”. In: *Nuclear Science Symposium Conference Record*. Vol. 26. IEEE. 2004.
- [53] F Lehner, C Lois, and H Voss. *Measurements on irradiated silicon sensor prototypes for the Inner Tracker of LHCb*. Tech. rep. CERN-LHCb-2004-104, 2004.
- [54] C Lois et al. *Laboratory Measurements on Irradiated Prototype Ladders for the LHCb Inner Tracker*. Tech. rep. CERN-LHCb-2004-112, 2004.
- [55] M Agari et al. *Studies of the Beetle 1.2 Pipeline Homogeneity*. Tech. rep. CERN-LHCb-2003-155, 2003.
- [56] R Antunes Nobrega et al. *LHCb reoptimized detector design and performance: Technical Design Report*. CERN-LHCb-TDR-009, 2003.
- [57] J Gassner et al. *Capacitance measurements on silicon micro-strip detectors for the TT station of the LHCb experiment*. Tech. rep. CERN-LHCb-2003-081, 2003.
- [58] R Antunes Nobrega et al. *LHCb Trigger System: Technical Design Report*. CERN-LHCb-TDR-010, 2003.
- [59] MK Werner et al. “Auswirkungen von Zahnimplantaten auf die Bildqualität in PET/CT und PET/MR”. In: *RöFo-Fortschritte auf dem Gebiet der Röntgenstrahlen und der bildgebenden Verfahren* 184.S 01 (), VO209.4.

## Teaching

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Massachusetts Institute of Technology

Cambridge, MA

[“An introduction to biomedical imaging”](#) (IAP)

Jan. 2015

Hospital Clínic de Barcelona

Spain

- “IX Course on Instrumentation and Quality Control in Nuclear Medicine” Nov. 2013
- “VIII Course on Instrumentation and Quality Control in Nuclear Medicine” Nov. 2011

University of Santiago de Compostela

Santiago de Compostela, Spain

- “Physics II” (BSc in Chemistry) 2010 & 2011
- “Medical Applications of Ionizing Radiation” (Ms in Physics) 2009 & 2010
- “Technological Applications of Ionizing Radiation” (Ms in Physics) 2010 & 2011

## Professional service

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Elected member of the IEEE Nuclear Medical and Imaging Sciences Council (2017-2019).

Review Editor in Biomedical Physics - Frontiers in Physics and Frontiers in Physiology.

ad hoc reviewer for *Medical Physics*, *Physics in Medicine and Biology*, *European Journal of Nuclear Medicine and Molecular Imaging - Physics*, and *Zeitschrift für Medizinische Physik*.

ad hoc reviewer for the Biomedical Research and Health Science Grants 2017, Andalusia, Spain

ad hoc reviewer for the Instituto de Salud Carlos III Grants 2015, in the modality of Technological Developments for Health Applications (AES 2015).

Management Committee Member to [EU COST Action TD1007](#) for “Bimodal PET-MRI molecular imaging technologies and applications for in vivo monitoring of disease and biological processes”.

Chair of the “PET imaging” session at the 2011 IEEE Nuclear Science Symposium and Medical Imaging Conference, Valencia, Spain.

## Professional licenses

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Radioactive Facilities Supervisor License, Spanish Nuclear Safety Council, 2009.