

Cristina Lois Gómez

Massachusetts Institute of Technology
Research Laboratory of Electronics, Room 36-705
77 Massachusetts Ave.
Cambridge, MA 02139-4307

phone: (617)-319-3615
email: clois@mit.edu
web: bit.ly/crislois

Academic positions

Harvard Medical School & Massachusetts General Hospital

Boston, MA

Research Fellow in Radiology

Jul. 2015–present

- Applied PET/MR imaging to search for markers of disease and progression in Huntington's Disease. This is being used in a clinical trial to test new treatments.
- Worked on multi-modal human neuroimaging to explore and develop new concepts in healthy and diseased brain function.

Massachusetts Institute of Technology

Cambridge, MA

"M+Vision" Research Fellow

Jul. 2012–June 2015

- Intensive training on identifying unmet clinical needs and design solutions with high translational potential and marketability.
- Investigated the biological basis of the placebo effect in depression using PET/MR imaging.
- Worked on the development of a new PET tracer for early assessment of treatment response in melanoma patients. Received a \$283K grant as co-PI to develop this project.

Hospital Clinic Barcelona

Barcelona, Spain

Visiting Researcher

Jan. 2012– Jun. 2012

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

Imaging Science Institute

Tübingen, Germany

Visiting Researcher

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.

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. Recipient of a 60K €grant as PI to carry out the project. Supervised a graduate student and a postdoc.

University of Tennessee Medical Center

Knoxville, TN

Postdoctoral Research Associate

Feb. 2007– Jul. 2008

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	Santiago de Compostela, Spain
Postdoctoral Research Assistant	<i>Sep. 2006–Jan. 2007</i>
Measured the neutron fluency in a linear accelerator to estimate its contribution to the radiation dose in radiotherapy patients.	
University of Zürich	Zürich, Switzerland
&	
University of Santiago de Compostela	Santiago de Compostela, Spain
Research & Teaching Assistant	<i>Sep. 2002–Jun. 2006</i>
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.	

Awards

M+Vision Fellowship	
Madrid-MIT M+Vision Consortium	<i>Jul. 2012</i>
Ranked 2nd among more than 100 applicants.	
“Best Oral Presentation in Nuclear Medicine”	
Spanish Nuclear Society Annual Meeting	<i>Oct. 2010</i>
Front cover of the Journal of Nuclear Medicine, Vol. 50	<i>Aug. 2009</i>
Featuring results on “Impact of Time-of-Flight on PET Tumor Detection”.	
José Castillejo Fellowship	
Ministerio de Educación y Ciencia, Spain	<i>Sep. 2007–Jun. 2008</i>
Ángeles Alvariño Fellowship	
Xunta de Galicia, Spain	<i>Dec. 2008–Dec. 2011</i>
Ranked 2nd among more than 200 applicants.	
Predoctoral research grant	
Universidad de Santiago de Compostela, Spain	<i>Oct. 2005–May 2006</i>
Excma. Diputación Provincial de A Coruña, Spain	<i>Jul. 2003–Jul. 2004</i>
Excma. Diputación Provincial de A Coruña, Spain	<i>Jul. 2002–Jul. 2003</i>

Grants

Treatment response in advanced melanoma patients
<i>Funding Agency:</i> Madrid-MIT M+Vision Consortium.
<i>Duration:</i> Feb. 2013–Dec. 2014.
<i>Budget:</i> \$283380.
<i>Principal Investigators:</i> Osasere Evboumwan and Cristina Lois.
Development of a pinhole SPECT system based on a conventional gamma camera
<i>Funding Agency:</i> Xunta de Galicia, Spain.
<i>Duration:</i> Dec. 2009–Dec. 2011.
<i>Budget:</i> 60000 €.
<i>Principal Investigator:</i> 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

PhD in Physics , with European Doctorate University of Santiago de Compostela	<i>Oct. 2001 - May 2006</i> Santiago de Compostela, Spain
MSc in Particle Physics & Non-linear Dynamics University of Santiago de Compostela	<i>Oct. 2001 - Sep. 2003</i> Santiago de Compostela, Spain
BSc in Physics University of Santiago de Compostela	<i>Oct. 1995 - Sept. 2001</i> Santiago de Compostela, Spain

Publications

See also my Google Scholar profile at 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] 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).
- [5] 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.
- [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] 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 (2012), VO209.4.
- [8] P Aguiar et al. “New developments in molecular imaging: positron emission tomography time-of-flight (TOF-PET)”. In: *Nuclear Espana* (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 Assembly 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)*. 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 (NSS-MIC 2011)*. 2011.
- [12] G Wagenknecht et al. "Attenuation Correction in MR-BrainPET with Segmented T1-Weighted MR Images of the Patients Head-A Comparative Study with CT". In: *2011 IEEE Nuclear Science Symposium, Medical Imaging Conference (NSS-MIC 2011)*. 2011.
- [13] Pablo Aguiar et al. "Monte Carlo optimization of SiPM readout configurations for continuous LYSO blocks". In: *Nuclear Science Symposium Conference Record (NSS/MIC), 2010 IEEE*. IEEE. 2010, pp. 3638–3640.
- [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] Cristina Lois et al. "Characterization of low energy Lu background on continuous LYSO blocks". In: *Nuclear Science Symposium Conference Record (NSS/MIC), 2010 IEEE*. IEEE. 2010, pp. 1–3.
- [16] 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.
- [17] 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), 2009 IEEE*. IEEE. 2009, pp. 2706–2709.
- [18] 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. NSS'08. IEEE*. IEEE. 2008, pp. 3829–3831.
- [19] AF Barbosa et al. "The LHCb Detector at the LHC". In: *Journal of Instrumentation* 3.08 (2008), S08005.
- [20] B. Bendriem. "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.
- [21] 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.
- [22] 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.
- [23] B Couce et al. "Parametrization of SiPM dynamic range contribution to energy resolution of scintillation light readout". In: *Nuclear Science Symposium Conference Record, 2008. NSS'08. IEEE*. IEEE. 2008, pp. 3973–3974.
- [24] Cristina Lois et al. "Physical and Clinical Evaluation of Standardized Uptake Values". In: *APS Meeting Abstracts*. Vol. 1. 2008, p. 16004.
- [25] 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.
- [26] M Agari et al. *Radiation monitoring system for the LHCb Inner Tracker*. Tech. rep. 2007.
- [27] RP Bernhard et al. *The LHCb silicon tracker*. Tech. rep. 2007.
- [28] 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.

- [29] Dmytro Volynskyy et al. *Production and quality assurance of detector modules for the LHCb silicon tracker*. Tech. rep. 2007.
- [30] M Agari et al. “The lhcb silicon tracker project”. In: *Nuclear Physics B-Proceedings Supplements* 150 (2006), pp. 114–117.
- [31] S Kostner et al. “LHCb silicon tracker performance studies”. In: *Nuclear Science, IEEE Transactions on* 53.4 (2006), pp. 2440–2445.
- [32] 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.
- [33] 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.
- [34] “Status and expected performance of the LHCb tracking system”. In: *Nuclear Physics B-Proceedings Supplements* 156.1 (2006), pp. 217–220.
- [35] Olaf Steinkamp. “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.
- [36] 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.
- [37] B Adeva et al. *Performance studies of the silicon strip detectors of the LHCb Silicon Tracker*. Tech. rep. 2005.
- [38] 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.
- [39] M Agari et al. *A radiation tolerant fiber-optic readout system for the LHCb Silicon Tracker*. Tech. rep. 2005.
- [40] M Agari et al. “Measurements of a prototype ladder for the TT station in a $120\sqrt{s}$ GeV/c π^- beam”. In: (2005).
- [41] M Agari et al. *Performance of long ladders for the LHCb Silicon Tracker*. Tech. rep. 2005.
- [42] G Baumann et al. *Pre-series sensor qualification for the inner tracker of LHCb*. Tech. rep. 2005.
- [43] G Baumann et al. *Quality Assurance of 100 CMS2-OB2 Sensors*. Tech. rep. 2005.
- [44] A Bay et al. *Hybrid design, procurement and testing for the LHCb Silicon Tracker*. Tech. rep. CERN, 2005.
- [45] 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.
- [46] S Cadeddu et al. *LHCb computing*. Tech. rep. LHCb-TDR-011, 2005.
- [47] F Lehner et al. *Mechanical and Thermal Characterisation of a TT Half-Module Prototype*. Tech. rep. 2005.
- [48] R Antunes Nobrega et al. “LHCb computing technical design report”. In: (2005).
- [49] Olaf Steinkamp. “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.

- [50] Achim Vollhardt et al. *Production of the LHCb silicon tracker readout electronics*. Tech. rep. CERN, 2005.
- [51] 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.
- [52] B Adeva et al. “The silicon tracker of the LHCb experiment”. In: *Nuclear Science Symposium Conference Record, 2004 IEEE*. Vol. 2. IEEE. 2004, pp. 1179–1182.
- [53] 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.
- [54] 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.
- [55] S Koestner et al. *The Silicon Tracker of the LHCb Experiment*. Vol. 26. contribution, 2004.
- [56] F Lehner, C Lois, and H Voss. “Measurements on irradiated silicon sensor prototypes for the Inner Tracker of LHCb”. In: *CERN-LHCb-2004-104* (2004).
- [57] C Lois et al. “Laboratory Measurements on Irradiated Prototype Ladders for the LHCb Inner Tracker”. In: *CERN-LHCb-2004-112* (2004).
- [58] M Agari et al. *Studies of the Beetle 1.2 Pipeline Homogeneity*. Tech. rep. CERN-LHCb-2003-155, 2003.
- [59] R Antunes Nobrega et al. “LHCb reoptimized detector design and performance: Technical Design Report”. In: (2003).
- [60] R Bernhard et al. “Measurements of prototype ladders for the silicon tracker with a laser”. In: *LHCb note in Vorbereitung* (2003).
- [61] S Cadeddu et al. *LHCb reoptimized detector design and performance*. Tech. rep. LHCb-TDR-009, 2003.
- [62] S Cadeddu et al. *LHCb trigger system*. Tech. rep. LHCb-TDR-010, 2003.
- [63] LHCb collaboration et al. *The re-optimized LHCb Detector Design and Performance*. Tech. rep. CERN/LHCC/2003-030, 2003.
- [64] 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.
- [65] R Antunes Nobrega et al. “LHCb Trigger System: Technical Design Report”. In: (2003).

Teaching

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

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

Referee for *Medical Physics*, *Physics in Medicine and Biology*, and *Zeitschrift für Medizinische Physik*.

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”.

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

Professional licenses

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