Cristina Lois Gómez

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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 *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
&
University of Santiago de Compostela Santiago de Compostela, Spain
Research & Teaching Assistant *Sep. 2002–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.

Awards

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 *Aug. 2009*
Featuring results on "Impact of Time-of-Flight on PET Tumor Detection".

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

Treatment response in advanced melanoma patients
Funding Agency: Madrid-MIT M+Vision Consortium.
Duration: Feb. 2013–Dec. 2014.
Budget: $283380.
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

PhD in Physics, with European Doctorate — *Oct. 2001 - May 2006*
University of Santiago de Compostela — Santiago de Compostela, Spain

MSc in Particle Physics & Non-linear Dynamics — *Oct. 2001 - Sep. 2003*
University of Santiago de Compostela — Santiago de Compostela, Spain

BSc in Physics — *Oct. 1995 - Sept. 2001*
University of Santiago de Compostela — Santiago de Compostela, Spain

Publications

See also my Google Scholar profile at bit.ly/cloispubs.

[1] C. Lois, P. Aguiar, B. Couce, A. Iglesias, *Characterization of low energy Lu background on continuous LYSO blocks* in *Nuclear Science Symposium Conference Record (NSS/MIC), 2010 IEEE*, IEEE, pp. 1–3.

[2] B. Couce, C. Lois, F. Gómez, A. Iglesias, P. Aguiar, *Parametrization of SiPM dynamic range contribution to energy resolution of scintillation light readout* in *Nuclear Science Symposium Conference Record, 2008. NSS'08. IEEE*, IEEE, pp. 3973–3974.

[3] P. Aguiar, C. Lois, B. Couce, A. Iglesias, *Monte Carlo optimization of SiPM readout configurations for continuous LYSO blocks* in *Nuclear Science Symposium Conference Record (NSS/MIC), 2010 IEEE*, IEEE, pp. 3638–3640.

[4] D. J. Kadrmas, M. E. Casey, M. Conti, B. W. Jakoby, C. Lois, D. W. Townsend. Impact of time-of-flight on PET tumor detection. *Journal of Nuclear Medicine* **2009**, *50*, 1315–1323.

[5] C. Lois, B. W. Jakoby, M. J. Long, K. F. Hubner, D. W. Barker, M. E. Casey, M. Conti, V. Y. Panin, D. J. Kadrmas, D. W. Townsend. An assessment of the impact of incorporating time-of-flight information into clinical PET/CT imaging. *Journal of Nuclear Medicine* **2010**, *51*, 237–245.

[6] F. Popota, P. Aguiar, Y. Fernandez, C. Lois, D. Pareto, D. Ros, J. Pavia, J. Gispert, *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, pp. 2706–2709.

[7] P. Aguiar, C. Lois, F. Gomez, A. Iglesias, *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, pp. 3829–3831.

[8] C. Lois, B. W. Jakoby, K. Hubner, M. Cañadas, D. W. Townsend, *Physical and Clinical Evaluation of Standardized Uptake Values* in *APS Meeting Abstracts*, p. 16004.

[9] M. Agari, R. Bernhard, A. Vollhardt, M. Schmelling, H. Voss, O. Steinkamp, F. Lehner, M. Needham, B. Schwingenheuer, C. Lois, et al., *Test-beam measurements on prototype ladders for the LHCb TT station and Inner Tracker*, Tech. Rep., CERN-LHCb-2003-082, **2004**.

[10] J. Gassner, C. Lois, F. Lehner, S. Heule, *Capacitance measurements on silicon micro-strip detectors for the TT station of the LHCb experiment*, Tech. Rep., CERN-LHCb-2003-081, **2003**.

[11] C. Lois. Silicon sensor probing and radiation studies for the LHCb silicon tracker. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **2006**, *568*, 277–283.

[12] G. Baumann, A. Büchler, T. Mattle, C. Lois, D. Boeni, L. Buchmann, F. Lehner, N. Chiapolini, N. Franz, S. Nüesch, et al., *Quality Assurance of 100 CMS2-OB2 Sensors*, Tech. Rep., **2005**.

[13] F. Lehner, C. Lois, H. Voss. Measurements on irradiated silicon sensor prototypes for the Inner Tracker of LHCb. *CERN-LHCb-2004-104* **2004**.

[14] C. Lois, R. Bernhard, M. Needham, A. Vollhardt, A. Wenger. Laboratory Measurements on Irradiated Prototype Ladders for the LHCb Inner Tracker. *CERN-LHCb-2004-112* **2004**.

[15] A. Vollhardt, D. Volyanskyy, M. Schmelling, P. Fauland, B. Carron, J. Van Hunen, H. Voss, P. Vazquez, A. Bay, S. Köstner, et al., *Production of the LHCb silicon tracker readout electronics*, Tech. Rep., CERN, **2005**.

[16] B. Adeva, M. Agari, C. Bauer, D. Baumeister, A. Bay, R. Bernhard, R. Bernet, J. Blouw, B. Carron, Y. Ermoline, et al.. The LHCb silicon tracker. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **2005**, *546*, 76–80.

[17] M. Agari, A. Vollhardt, M. Schmelling, W. Hofmann, H. Voss, R. Bernhard, O. Steinkamp, F. Lehner, M. Needham, B. Schwingenheuer, et al., *Studies of the Beetle 1.2 Pipeline Homogeneity*, Tech. Rep., CERN-LHCb-2003-155, **2003**.

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[19] G. Baumann, A. Büchler, T. Mattle, D. Boeni, L. Buchmann, F. Lehner, N. Chiapolini, C. Lois, S. Nüesch, E. Eisenring, et al., *Pre-series sensor qualification for the inner tracker of LHCb*, Tech. Rep., **2005**.

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[21] D. Volyanskyy, E. Pérez-Trigo, J. Van Tilburg, O. Steinkamp, V. Yakovenko, M. Needham, O. Schneider, S. Köstner, K. Vervink, L. Nicolas, et al., *Production and quality assurance of detector modules for the LHCb silicon tracker*, Tech. Rep., **2007**.

[22] M. Agari, B. Carron, O. Steinkamp, J. Van Hunen, M. Needham, S. Köstner, K. Vervink, A. Bay, C. Lois, D. Volyanskyy, et al., *A radiation tolerant fiber-optic readout system for the LHCb Silicon Tracker*, Tech. Rep., **2005**.

[23] S. Koestner, B. Adeva, M. Agari, C. Bauer, D. Baumeister, A. Bay, R. Bernhard, R. Bernet, J. Blouw, B. Carron, et al., *The Silicon Tracker of the LHCb Experiment*, *Vol. 26*, contribution, **2004**.

[24] M. Agari, M. Bauer, T. Blake, J. Blouw, D. Esperante-Pereira, J. Gassner, S. Köstner, C. Lois, M. Needham, A. Perrin, et al.. Measurements of a prototype ladder for the TT station in a 120˜ GeV/c π^- beam. **2005**.

[25] B. Adeva, B. Carron, O. Steinkamp, F. Lehner, Y. Ermoline, S. Köstner, O. Schneider, A. Bay, M. Tran, C. Lois, et al., *Performance studies of the silicon strip detectors of the LHCb Silicon Tracker*, Tech. Rep., **2005**.

[26] O. Steinkamp, et al.. Design and production of detector modules for the LHCb Silicon Tracker. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **2007**, *579*, 736–741.

[27] M. Agari, B. Carron, E. Pérez-Trigo, O. Steinkamp, J. Van Hunen, N. Smale, M. Needham, O. Schneider, S. Köstner, K. Vervink, et al., *Performance of long ladders for the LHCb Silicon Tracker*, Tech. Rep., **2005**.

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[31] B. Adeva, M. Agari, C. Bauer, D. Baumeister, A. Bay, R. Bernhard, R. Bernet, J. Blouw, B. Carron, Y. Ermoline, et al., *The silicon tracker of the LHCb experiment* in *Nuclear Science Symposium Conference Record, 2004 IEEE*, IEEE, pp. 1179–1182.

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[37] C. Lois-Gómez, P. (Dir: Adeva-Andany, B & Vázquez-Regueiro, *Study of Silicon Microstrip Detector Properties for the LHCb Silicon Tracker*, Ph.D. thesis, CERN-THESIS; University of Santiago de Compostela, **2006**.

[38] A. Barbosa, I. Bediaga, G. Cernicchiaro, G. Guerrer, A. Machado, J. Magnin, F. Marujo, J. d. Miranda, A. Reis, A. Santos, et al.. The LHCb Detector at the LHC. *Journal of Instrumentation* **2008**, *3*, S08005.

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[40] M. Agari, C. Bauer, D. Baumeister, J. Blouw, W. Hofmann, K. Knopfle, S. Lochner, M. Schmelling, V. Pugatch, A. Bay, et al.. The lhcb silicon tracker project. *Nuclear Physics B-Proceedings Supplements* **2006**, *150*, 114–117.

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[42] O. Steinkamp. Performance of long ladders for the LHCb silicon tracker. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **2006**, *569*, 84–87.

[43] M. C.-C. L. B. J. M. L. C. H. C. W. M. Conti, D. Townsend, B. Bendriem. Assessment of the clinical potential of a time-of-flight PET/CT scanner with less than 600 ps timing resolution. *Journal of Nuclear Medicine* **2008**, *49*, 411P.

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[45] K. Vervink. Design and performance of the LHCb Silicon Tracker. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **2006**, *566*, 170–173.

[46] H. Voss. The LHCb silicon tracker. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **2005**, *549*, 44–48.

[47] R. Bernhard, et al.. The LHCb silicon tracker. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* **2008**, *596*, 17–20.

[48] P. Aguiar, A. Iglesias, B. Couce, C. Lois. A feasibility study on the use of arrays of discrete SiPMs for MR compatible LYSO readout using Monte Carlo simulation. *Journal of Instrumentation* **2012**, *7*, P06002.

[49] C. Lois, I. Bezrukov, H. Schmidt, N. Schwenzer, M. K. Werner, J. Kupferschläger, T. Beyer. Effect of MR contrast agents on quantitative accuracy of PET in combined whole-body PET/MR imaging. *European Journal of Nuclear Medicine and Molecular Imaging* **2012**, *39*, 1756–1766.

[50] P. Aguiar, C. Lois. Analytical study of the effect of the system geometry on photon sensitivity and depth of interaction of positron emission mammography. *Journal of Oncology* **2012**, *2012*.

[51] M. Werner, J. Wiegand, J. Kupferschläger, C. Lois, I. Bezrukov, H. Schmidt, T. Beyer, C. Pfannenberg, N. Schwenzer. Auswirkungen von Zahnimplantaten auf die Bildqualität in PET/CT und PET/MR. *RöFo-Fortschritte auf dem Gebiet der Röntgenstrahlen und der bildgebenden Verfahren*, *184*, VO209_4.

[52] S. Cadeddu, P. Dalpiaz, Z. Guzik, Y. Vasiliev, S. Köstner, E. Spiridenkov, F. Wilson, A. Khan, P. Perret, O. Schneider, et al., *LHCb trigger system*, Tech. Rep., LHCb-TDR-010, **2003**.

[53] S. Cadeddu, P. Dalpiaz, Z. Guzik, Y. Vasiliev, S. Köstner, E. Spiridenkov, F. Wilson, A. Khan, P. Perret, O. Schneider, et al., *LHCb reoptimized detector design and performance*, Tech. Rep., LHCb-TDR-009, **2003**.

[54] S. Cadeddu, P. Dalpiaz, S. Stoica, Z. Guzik, Y. Filipchenko, S. Köstner, E. Spiridenkov, F. Metlica, M. Barnyakov, A. Smith, et al., *LHCb computing*, Tech. Rep., LHCb-TDR-011, **2005**.

[55] C. Lois, J. Kupferschläger, I. Bezrukov, H. Schmidt, M. Werner, J. Mannheim, B. Pichler, N. Schwenzer, T. Beyer, *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)*.

[56] G. Wagenknecht, E. R. Kops, F. Mantlik, E. Fried, T. Pilz, H. Hautzel, L. Tellmann, B. Pichler, H. Herzog, C. Lois, 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)*.

[57] M. Conti, C. Lois, K. Hubner, M. Long, B. Jakoby, W. Howe, M. Casey, V. Panin, C. Watson, B. Bendriem, et al., *Clinical evaluation of time-of-flight imaging* in *European Journal Of Nuclear Medicine and Molecular Imaging*, SPRINGER 233 SPRING ST, NEW YORK, NY 10013 USA, pp. S166–S166.

[58] P. Aguiar, B. Couce, A. Iglesias, C. Lois. New developments in molecular imaging: positron emission tomography time-of-flight (TOF-PET). *Nuclear Espana* **2011**.

[59] O. Evbuomwan, F. Schroeder, C. Lois, M. Gee, J. Hooker. Synthesis and evaluation of a radiolabeled stapled peptide for monitoring the apoptotic state of tumors. *Journal of Nuclear Medicine* **2014**, *55*, 1043–1043.

[60] P. Aguiar, J. Silva-Rodriguez, D. González-Castaño, F. Pino, M. Sanchez, M. Herranz, A. Iglesias, C. Lois, A. Ruibal. A portable device for small animal SPECT imaging in clinical gamma-cameras. *Journal of Instrumentation* **2014**, *9*, P07004.

[61] C. Lois, J. Kupferschläger, I. Bezrukov, H. Schmidt, M. Werner, J. Mannheim, B. Pichler, N. Schwenzer, T. Beyer, *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)*.

[62] O. Steinkamp, D. Volyanskyy, M. Agari, C. Bauer, J. Blouw, W. Hofmann, S. Löchner, F. Maciuc, M. Schmelling, N. Smale, 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*.

[63] H. Schmidt, N. Schwenzer, I. Bezrukov, A. Kolb, F. Mantlik, J. Kupferschläger, C. Lois, A. Sauter, C. Brendle, C. Pfannenberg, 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)*.

[64] F. Popota, P. Aguiar, S. España, C. Lois, J. Udias, D. Ros, J. Pavia, J. Gispert. Monte Carlo simulations versus experimental measurements in a small animal PET system. A comparison in the NEMA NU 4-2008 framework. *Physics in Medicine and Biology* **2015**, *60*, 151.

[65] R. Bernhard, E. Pérez-Trigo, J. Van Tilburg, O. Steinkamp, V. Yakovenko, O. Schneider, K. Vervink, L. Nicolas, M. Bettler, A. Bay, et al., *The LHCb silicon tracker*, Tech. Rep., **2007**.

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.