Curriculum Vitae of Paul Lecoq

Academic degrees:

- PhD in Nuclear Physics, at the University of Grenoble, France, (1974), with honors (Mention très honorable avec felicitations du jury)
- Master of Physics at the University of Montreal, Canada, (1973)
- Diplôme d'Ingénieur de l'Institut National Polytechnique de Grenoble, ENSI, (1972), with honors (5^{th})
- Diplôme d'Etudes Approfondies (DEA) in Nuclear Instrumentation at the University of Grenoble, France, (1972), with honors
- Master of physics at the University of Grenoble, France, (1971), with honors

Awards

- 2024: IEEE Ed Hoffman Medical Imaging Scientist award
- 2023: Dr Honoris Causa of the Polytechnic University of Valencia (Spain)
- 2021: IEEE Best paper award in the Transactions of Nuclear Sciences
- 2020: IEEE TRPMS Best Paper Award: Pushing the limits in Time-of-Flight PET Imaging, P. Lecoq, IEEE Trans. Radiat. Plasma Med. Sci. 1(6):473-485 (2017)
- 2019: IEEE NPSS Merit Award, which recognizes excellence in technical contributions to the fields of nuclear and plasma sciences.
- 2017: Elected Head of the Physics Division at the European Academy of Sciences (EURASC.eu)
- 2016: Honorary Doctor of the Kharkiv Institute of Single Crystals, Academy of Sciences of Ukraine
- 2015: IEEE Fellow
- 2008: Elected Member ot the European Academy of Sciences

Academy, editorial activities, memberships

- Fellow Member of International Association od Advanced Materials
- IEEE NPSS ADCOM Elected Member (2015-2020)
- Elected member of the European Academy of Sciences (since 2008)
- CERIMED (Euroepean Center for Reserach in Medical Imaging) Scientific Policy Committee Chairman
- OPTITEC (competitiveness cluster) Nominated chairman of the Strategic Committee (since 2013)

- Chairman of the IEEE Nulear Sciences Symposium to be held in Valenia, Spain, in October 2011 (2200 attendees)
- Member of the Strategic Committee of the Cristal Innov platform in Rhône-Alpes region
- IEEE RISC (Radiation Instrumentation Scientific Commitee) Member (2003-2006), MISC (Medical Imaging Scientific Committee) Member (since 2010), Oversight Committee member (since 2009)
- ISTC (International Science and Technology Center) Scientific Advisory Committee Member (1995-2000)
- Cancéropôle Rhône-Alpes (CLARA) Scientific Advisory Committee Member (since 2006)
- OPTITEC (competitiveness cluster) Strategic Committee Member (since 2006)
- SUBATECH (Nantes) Scientific Committee Member (since 2009)
- IEEE Member (since 2005)
- ESMI (European Society on Molecular Imaging) Member since 2009
- Nuclear Instruments and Methods Reviewer
- IEEE Transaction in Nuclear Sciences Reviewer
- Physica Status Solidi Reviewer
- Chairman of CRYSTAL2000, the 1st International Conference on Inorganic Scintillators and their Applications, Chamonix, France, 22-26 Sept 1992
- Chairman of SCINT2001, the 6th International Conference on Inorganic Scintillators and their Applications, Chamonix, France, 16-21 Sept 2001
- Chairman of ITBS2003, the 2d International Conference on Imaging Technologies in Biomedical Sciences, Milos, Greece, 26-30 May, 2003
- Chairman of EuroMedIm2006, the 1st International Conference on Molecular Imaging Technology, Marseille, France, 9-12 May, 2006

International committees:

- CERIMED (European Center for Research in Medical Imaging) Scientific Policy Committee Chairman
- IEEE RISC (Radiation Instrumentation Scientific Committee) Member
- IEEE NPSS ADCOM Member
- ISTC (International Science and Technology Center) Scientific Advisory Committee Member
- Member of the Evaluation Committee for research projects on behalf of the Italian Ministry of Education, University and Research and the Evaluation of research products (VQR)
- International evaluator for the Georgia National Science Foundation

- International evaluator for the Natural Sciences and Engineering Research Council of Canada
- International evaluator for the Hercules Foundation for Research Infrastructures in Netherlands
- International evaluator of the National Science Center in Poland

National committees:

- Member of the Evaluation Committee for the French National Research Agency (ANR)
- Member of the Evaluation Committee for the French National Institute of Cancer (INCa)
- Member of the Evaluation Committee for the Parid-Sud University
- "Cancéropôle Rhône-Alpes" (CLARA) Scientific Advisory Committee Member
- OPTITEC French competitiveness cluster for complex optical systems: Chairman of the Strategic Committee
- Cristal-Innov French mutualised platform for crystallographic industry: Scientific Advisory Committee Member

Work experience:

Positions held:

Time period	Organization	Position held & Responsibility
Since October 2024	METACRYSTAL SA	CEO
Since February 2023	Polytechnic University of Valencia, Spain	Doctor Honoris Causa
January 2020 to December 2021	Polytechnic University of Valencia, Spain	Distinguished Professor
September 2019-Dec. 2023	Multiwave Metacrystal SA	CEO
Since 2022	CERN	Contract of Contributing Retiree
2018-2022	CERN	Honorary Member

Since 2017	European Academy of Sciences	Head of the Physics Division
2015-2018	CERN	Guest Professor
2013-2018	European Research Coucil	ERC Advanced Grant
1995-2014	CERN	Senior Physicist with diplomatic status
1988- 2014	CERN	Senior Physicist
2011-2016	CERN&CERIMED	Technical coordinator of FP7 EndoTOFPET-US project
Since 2007	CERN&CERIMED	Technical coordinator of ClearPEM-Sonic project (Delivered in Marseille North hospital in Dec 2010, now at San Gerardo hospital, Milano, Italy)
2002 - 2014	CERIMED	Initiator and Technical Director of CERIMED in Marseille (Centre Européen de Recherche en Imagerie Médicale)
2005-2007	CERN	Technical coordinator of INTAS project 7519 (Novel A^2B^6-Based Integrated Heterostructure Scintillation Detectors (IHSD) of Ionizing Radiation) involving Ukraine, Moldavia, Vilnus
1992-2004	CERN	Group Leader & Technical coordinator of the PWO electromagnetic calorimeter of the CMS experiment at the CERN Large Hadron Collider (LHC)
1991-2000	CERN	Initiator and Spokesman of the "Crystal Clear" collaboration (15 Institutes worldwide, 83 physicists)
1980-1991	CERN	Deputy group leader & Technical coordinator of the BGO calorimeter of the L3 experiment at CERN Large Electron Positron Collider LEP (Spokesman Prof. Samuel Ting, Nobel laureate)
1977-1988	CERN	Physicist in Physics dept
1974-1977	CERN	Fellow in Physics dept
1973-1974	French Navy School, Brest, FR	Nuclear Physics Teacher

1972-1973	University of Montreal, Canada	Research assistant
1971-1972	Institut des Sciences Nucléaires, Grenoble, FR	Research assistant

Major scientific contributions:

2019: Initiator of the 10ps Time-of-Flight PET challenge: https://the10ps-challenge.org

Since 2015: Initiative to coordinate the research and development of medical and molecular imaging technologies in Europe. Launch of the ERAMMIT project (Enabling Research Access to Multiparametric Molecular Imaging Technologies) in the frame of the EU INFRA-IA2 call. Successfully passed level 1 of the evaluation process.

Since 2013: PI of the ERC Advanced Grant N°338953 – TICAL and the two associated Proof-of-concpet projects (ULTIMA and TWIST). In this context, major advances in in the domain of Time-Of-Flight PET scanners and ultrafast timing with scintillator-based detectors.

2011-2016: Coodination for the design, construction and commissioning of the first ever built endoscopic PET scanner, for the development of new biomarkers for the pancreatic and prostate cancers, as technical coordinator of the EU-funded project EndoTOFPET-US.

2002-2014: Launch in 2002 of an initiative for the construction of an international medical imaging research centre, built in Marseille and inaugurated in July 2014 (Cerimed).

Since 2000: Strong involvement in the development of dedicated breast imaging camera combining several modalities for a multiparametric evaluation of breast tumors (anatomic, structural and functional)

1994-2000: Organizer of the development and mass production organization of Lutetium Aluminum perovskite crystals in particular for PET scanner applications. One patent on this subject.

1994-2007: As Technical coordinator of the CMS electromagnetic calorimeter at the LHC Large Hadron Collider, responsible for the technical development and the mass production of 76’000 Lead Tungstate crystals (100 tons) in Russia and in China. This calorimeter has played in central role in the discovery of the Higgs boson in 2012.

Since1992: Organizer of a cycle of international conferences on "Heavy scintillators for scientific and industrial applications" First one in Chamonix, France in 1992 (200 participants), 10th one in Keju, Korea (NC, USA) in 2009 (300 participants), next one in Chamonix in September 2017 (250 registered experts worldwide).

Since 1991: Organizer and coordinator of a worldwide public-private R&D effort for the development of new scintillators for physics, medical and industrial applications

Initiator and Spokesman of the Crystal Clear international collaboration for this R&D. Co-leader of 2 other R&D projects financed by the European Community.

1984-1990: Active participation in the technical development and the industrial production of 12,000 BGO crystals for the L3 experiment at LEP. Responsible for the assembly of the BGO electromagnetic calorimeter at CERN (30 publications as main author)

1980-1985: Conception of a new recording method of bubble chamber and streamer chamber tracks with holograms for the study of short lived particules (one experiment, 40,000 holograms recorded, 5 publications)

Education & Training:

Thesis supervisor, jury member or reporter

1. **X-ray driven photon bunching,** Shaul Katznelson, Technion University, Haifa, Israel, January 2026, 119p.
2. **Conception d'un prototype de tomodensitomètre utilisant le temps de vol de photons**, J. Rossignol, Université de Sherbrooke, Québec, Canada, Nov. 2024, 142p.
3. **Development and Performance Evaluation of High Resolution TOFPET Detectors Suitable for Novel PET Scanners**, E. Lamprou, Technical University of Valencia, Spain, January 2021, 149p.
4. **Conception et réalisation de l'électronique frontale numérique 3D pour une matrice de détecteurs monophotoniques destinée à la Tomographie d'Émission par Positrons**, M. A. Tétrault, Université de Sherbrooke, Québec, Canada, March 2017, 200p.
5. **Inspection and characterization of birefringent materials: development of methods and systems for scintillating anisotropic crystals,** L. Montalto, University Politecnica Delle Marche, Italy, March 2017, 86p.
6. **Optimization of a Single-Phase Liquid Xenon Compton Camera for 3γ medical imaging,** L. Gallgo Manzano, University of Nantes, France, July 2016, 346 p.
7. **Tomographie hybride simultanée TEP/TDM combinant détecteurs à pixels hybrides et modules phoswich à scintillateurs,** M. Hamonet, Aix-Marseille University, France, March 2016, 180 p.
8. **Photonic crystals: Enhancing the Light Output of Scintillation Based Detectors**, A. Knapitsch, Vienna University of Technology, Austria, October 2012, 189 p.
9. **Development of the ClearPEM-Sonic, a combined positron emission mammograph and ultrasound scanner,** B. A. Frisch, Vienna University of Technology, Austria, October 2012,

135 p.

10. **Optimization of the light extraction from heavy scintillating crystals** / M. Kronberger, CERN-THESIS-2008-043 - Vienna, Austria : TU Vienna, 2008. - 186 p.□□□□□□
11. **Study of a Positron Emission Mammograph** / Trummer, J CERN-THESIS-2007-074 ; - Vienna : Wien TU, Austria, 2007. - 139 p.
12. **YAP-(S)PET: a small animal PET/SPECT scanner. Performance and applications in oncology, cardiology and neuroscience /** Bartoli A. Universita Degli Studi di Pisa, Italy, Thesis FIS/07, 179 p.
13. **Tomographie Ultrasonore. Application à l'imagerie du sein** / Mensah S., Université de la Méditerranée Aix-Marseille II, France, Habilitation à diriger les recherches, Oct. 2006
14. **Localisation des interactions de rayonnements ionisants sur des fibres monocristallines scintillatrices** / Anfré P. Université Lyon I – Claude Bernard THESIS, France, August 2006
15. **Habilitation à diriger les recherches** / Dujardin C. Université Lyon I – Claude Bernard, France, Jan 2003
16. **Evaluation of New Inorganic Scintillators for Application in a Prototype Small Animal PET Scanner** / Kuntner, C , CERN-THESIS-2004-026 ; - Geneva : CERN, Switzerland, 2003. - 189 p.

Teaching activities:

- School on Biomedical Imaging, Cargèse, Corsica, October 2023
- TOPIM school of the European Society of Molecular Imaging (ESMI), Chania, Creete, July 2016
- CERN: Medical physics lectures for college physics teachers (yearly)
- ICFA School on Instrumentation in Particle Physics, Bariloche, Argentina: Lectures on scintillators and calorimeters (2010), and Bogota, Columbia (2013), Cuba (2017)
- TransEuropean School on High Energy Physics, Bucarest, Romania: Lectures on scintillators and medical physics (2010)
- CERN EDIT school on detectors: Lectures on scintillators (2011)
- PICOSEC Marie-Curie project: Lectures on scintillators (2012)

Funding ID:

- ERC grant ***N°338953–TICAL***: 2,258M€ for the period Feb2014- Dec2018 and two related Proof of Concept projects: ULTIMA and TWIST
- Management of the EU budget of the FP7 EndoTOFPET-US project (5'516'000€, including 990'000€ CERN allocation)
- Management of the ClearPEM-Sonic collaboration budget: (1'235'000€, including 180'000€ CERN participation)
- Yearly CERN operation budget for running scintillator R&D (100'000 CHF)

- Budget for the construction of the electromagnetic calorimeter of the CMS experiment at the CERN Large Haron Collider (LHC): > 20M€ over about 10 years.

Patents:

1. Patents on phoswich technology based oin LuYAP crystals: UK Patent Application No. 0115596.9, and PCT/IB02/02176
2. Patent application 07 290 224.0 filed on 21st February 2007. "Combined nuclear and sonoraphic imaging apparatus and method"
3. Patent P202030081, Feb. 3 2020 "Device for Detection of Gamma Rays based on Metascintillator Block Detectors".
4. Patent EP21153601.6A, Jan.26, 2021, "Devices and methods for detecting gamma radiation"

Language competence:

- French: mother tongue
- English: fluent
- German: some level of understanding
- Russian: some level of understanding

Personal skills and competences:

- Long experience in coordinating large multi-national and multi-disciplinary teams
- Ability to resolve crisis situations through compromises and to be recognized and accepted as an arbitrator in conflictual situations
- Considered as a mentor by PhD students working in my group
- Recognized skills in scientific popularization