

Patrice VERDIER - Curriculum Vitae



Born May 13th, 1975 in Villeurbanne, France

Nationality: French

Institut de Physique des 2 Infinis de Lyon - LMA Bat. Virgo

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Current position: Experimental Physicist at Institut de Physique des 2 Infinis de Lyon (IN2P3). In January 2021, I have joined the “Gravitational Wave” Team of IP2I Lyon to work in the Virgo collaboration and on the Einstein Telescope (ET) project. Since January 2023, I am coordinating the French contribution to ET.

Employment and Education

2019 Research director 1st class (DR1) at CNRS.
2013 Research director 2nd class (DR2) at CNRS.
2007 Habilitation (HDR) - Referees: P. Petroff, A. Djouadi, P. Janot.
2001 Recruited at CNRS (CR2).
1998 – 2001 PhD Thesis, Univ. Lyon 1, “Squarks and gluinos searches in the DELPHI experiment at LEP” - Supervisor: S. Katsanevas; Referees: P. Binetruy, D. Froidevaux; Special mention of the jury - Daniel Guinier young researcher prize (French Physical Society, 2001).

Positions at CNRS

Since 2021 [Institut de Physique des 2 Infinis de Lyon](#)
2016 – 2020 [IN2P3, Paris](#)
2005 – 2015 [Institut de Physique Nucléaire de Lyon](#)
2001 – 2005 [Laboratoire de l’Accélérateur Linéaire, Orsay](#)

Scientific Activities

Since 2021: Virgo and Einstein Telescope Collaborations

Co-chair of the E-Infrastructure board of ET (computing & software); coordination of French contribution to ET; establishment of the Project Office of ET within the EU project “ET Preparatory Phase”; detector performance and analysis of coalescences of black holes and neutron stars in Virgo.

2008-2016: CMS Collaboration at CERN-LHC

Measurement of the mass of the top quark in decays with a J/ψ meson at CMS; search for physics beyond the standard model in the jets+leptons+missing Et channel; data quality of CMS tracker.

2001-2010: DØ Collaboration at Fermilab-Tevatron

Searches for squarks and gluinos and other BSM physics scenario (leptoquarks and little Higgs models) in the jets+missing Et Channel; SM Higgs boson search; development of calorimeter algorithms, performance of missing Et reconstruction, calorimeter data quality; design, tests and installation of the processor boards of the DØ Level 2 trigger system.

1998-2001: DELPHI Collaboration at CERN-LEP

Data analysis using neural networks techniques at LEP2 to search for supersymmetry in R-parity conserved scenario (stop and sbottom squarks) and to search for stable R-hadrons in the light gluino scenario.

Collaborations with theoretician colleagues on Beyond-the-Standard-Model phenomenology

Supersymmetry, Little-Higgs models, Leptoquarks, Lepton Flavor Violation.

Main Scientific responsibilities

Since 2023 Director of “Laboratoire des Matériaux Avancés” (IN2P3 Lab).

Since 2023 French PI of the Einstein Telescope project.

Since 2022 Coordination of CNRS participation in the EU funded project “ET Preparatory Phase”.

Since 2021 Co-chair of the Einstein Telescope E-Infrastructure Board; member of the Einstein Telescope Executive Board; representative of IP2I at the Einstein Telescope Collaboration Board.

2013-2015 CMS Team Leader at IPN Lyon (18 staff physicists).

2009-2015 Co-convenor of the “Higgs and Supersymmetry” Working Group of the GDR Terascale.

2003-2010 Responsibilities in the DØ experiment: co-convenor of the “High mass Higgs group” (2010); DØ representative at the “Tevatron New Phenomena Working Group” (2007-2010); co-convenor of the “New Phenomena” physics group (2007-2008); elected member of the Advisory Council of the DØ experiment (2006-2008); co-convenor of the “calorimeter algorithms” group (2004-2005); co-convenor of the “Missing Et” group (2003-2006).

Research management

Since 2021 IN2P3 Project manager

Coordinator of the exercise to update the French strategy in nuclear, particle and astroparticle physics (<https://prospectives2021.in2p3.fr>); Coordinator of IN2P3's contribution to the update of the 2021 French roadmap for research infrastructures (Nuclear & High Energy Physics).

2019-2020 Deputy Director of IN2P3

As Deputy Director of Reynald Pain, I was involved in the general management of the institute which operates 31 laboratories, comprising 3200 staff from IN2P3 and universities. I was particularly in charge of large research infrastructures and I worked with CNRS and French Ministry of Research for the preparation of the DUNE project, for the update of the European Strategy for Particle Physics (ESPP 2020) and for the preparation of the 2021 ESFRI update. I was also in charge of international affairs and the highlights of my work were the organization of the bilateral meetings between IN2P3 and its international partners, and the creation of two international research laboratories, ILANCE with the University of Tokyo and DMLab with the Helmholtz Alliance.

2016-2018 Scientific Director for particle & hadronic physics at IN2P3

Coordination of IN2P3 contributions to the four LHC experiments at CERN (ALICE, ATLAS, CMS, LHCb), the Belle-2 experiment at KEK, experiments at Jefferson Lab, the long-baseline neutrino experiments in Japan (T2K) and in the US (DUNE), ultra-cold-neutron experiments at PSI (nEDM), tests of gravitational behavior of anti-hydrogen atoms at CERN (AEGIS, Gbar), and all associated R&D programs, especially those for future colliders; also in charge of the theory programs in these domains at IN2P3. The highlights of my works during my mandate were the coordination of IN2P3 implication in the ATLAS and CMS upgrades (total M&S budget of 67 M€ for phases 1 and 2 and 300 staff involved), and especially the setting-up of IN2P3 funding request to the Ministry of Research for the HL-LHC that was approved in 2017. I also supervised the entry of IN2P3 in the Belle-II collaboration and the initial preparation of French participation in the DUNE project.

2011-2015 Deputy Director of IPN Lyon laboratory (220 employees)

As deputy director of Guy Chanfray, I was in charge with the management team of operating the laboratory under supervision of IN2P3 and University Lyon 1, in particular the definition of the scientific policy, resources requests and allocations, scientific projects follow-up. An important aspect of my work has been the implementation of IPNL activities and the start of new projects within the labex "Lyon Institute of Origins", an "Investissement d'Avenir" program from the Ministry of higher education and scientific research that started in 2011.

Main participation to Committees & Councils

International:

- Since 2023** Scientific delegate of the French ministerial delegation in the "Board of Governments Representatives" for the preparation of the "Einstein Telescope Organization".
- Since 2023** Member of the "Neutrino Scope Group" (DUNE neutrino project at Fermilab).
- Since 2021** Co-chair of the steering committee of the DMLab IRL (joint Helmholtz-IN2P3 laboratory).
- 2018-2021** Member of the International Neutrino Council.
- 2016-2018** IN2P3 representative at the LHC Resource Review Board, at the DUNE Resource Review Board, and at the T2K and Belle-II International Financial Overview Panels.

France:

- Since 2021** Member of the scientific council of LPSC Grenoble and IP2I Lyon.
- 2021** Member of the PNHE (Nuclear Phys. & HEP) committee for the update of the French Research Infrastructure Roadmap.
- 2019-2020** Member of the Direction Committee of GANIL.
- 2018** Member of the PNHE (Nuclear Phys. & HEP) committee for the update of the French Research Infrastructure Roadmap?
- 2011-2015** Member of the executive and scientific committees of the labex "[Lyon Institute of Origins](#)".

Publications & Conferences

1085 publications, 27 with major contributions; the complete list is available on <https://inspirehep.net/author/profile/P.Verdier.1>

Selection of the 5 main publications:

- [1] V. Khachatryan et al. (CMS Collaboration), "Measurement of the mass of the top quark in decays with a J/psi meson in pp collisions at 8 TeV," JHEP 1612 (2016) 123;
- [2] S. Davidson and P. Verdier, "LHC sensitivity to the decay of a Higgs boson to tau mu," Phys. Rev. D 86 (2012) 111701(R);
- [3] V.M. Abazov et al. (DØ Collaboration), "Search for squarks and gluinos in events with jets and missing transverse energy using 2.1fb⁻¹ of ppbar collision data at $\sqrt{s}=1.96$ TeV," Phys. Lett. B 660, 449 (2008);
- [4] M. S. Carena, J. Hubisz, M. Perelstein and P. Verdier, "Collider signature of T-quarks," Phys. Rev. D 75 (2007) 091701;
- [5] J. Abdallah et al. (DELPHI Collaboration), "Searches for supersymmetric particles in e⁺ e⁻ collisions up to 208-GeV and interpretation of the results within the MSSM," Eur. Phys. J. C 31, 421 (2004).

46 collaboration internal-notes, 23 for contributions to international conferences; 22 invited talks at international conferences.

Member of the international advisory committee of the conferences NuFact, LCWS, PANIC and of the International Schools "Asia-Europe-Pacific School of High-Energy Physics" and "African School of Physics" (2019-2021).

Main contributions to strategy documents:

- [1] R. Pain, B. Giebels, P. Verdier, "Reaching for the Infinities – A strategic Plan for French Nuclear, Particle, and Astroparticle Physics in the 2030 Horizon," <https://doi.org/10.5281/zenodo.7794586>, December 2022.
- [2] French national roadmap for research infrastructures 2021, PNHE section, Editor: MESRI, March 2022;
- [3] French contributions to the DUNE experiment and to the PIP-II accelerator, scientific, technical and financial document prepared for the Haut Conseil and Direction Committee of TGIR, September 2019;
- [4] French national roadmap for research infrastructures 2018, PNHE section, Editor: MESRI, May 2018;
- [5] IN2P3 contribution to the update of European Strategy for Particle Physics, December 2018;
- [6] French contributions to the ATLAS and CMS upgrades for the HL-LHC, scientific, technical and financial document prepared for the Haut Conseil and Direction Committees of TGIR, September 2019.

Training, Teaching & Outreach

PhD supervision

- E. Bouvier, "Top quark mass measurement using ttbar events with a J/psi in the final state in the CMS experiment at the LHC" (2016).
- J. Chasserat "Search for third generation leptoquarks in the CMS experiment at the LHC" (2014).
- Y. Tschudi, "Cosmic-muons reconstruction and search for gluinos decaying in stop-top in the CMS experiment at the LHC" (2011).

Supervision of 15 Licence & Master students during their internships at the lab on BSM, Higgs, Top, and GW physics.

Member of 17 PhD evaluation committees, and of 5 juries of "Habilitation à Diriger des Recherches";

Member of several appointment committees for university positions in France (Univ. Lyon 1, Univ. Paris-Cité).

Teaching: 2010-2015 Lectures on "Particles & symmetries", Master 1 ENS Lyon (30 hours per year).

Outreach: Frequent contributions to outreach events, keynote talks and seminars for the general public, teaching staff, and industry - recent examples: ET-France meets industry, CERN teacher program, ORANO-IN2P3 seminar, Fête de la sciences.